DEVELOPMENT REVIEW BOARD REPORT

Meeting Date:	May 7, 2026
General Plan Element:	*Character and Design*
General Plan Goal:	*Foster quality design that enhances Scottsdale as a unique southwestern desert community.*

ACTION

Shade & Tree Plan for the Built Environment 11-DR-2025	Request to adopt Development Review Board Resolution No. 10, adopting the Shade & Tree Plan for the Built Environment (the Plan) as citywide design guidance for shade infrastructure to inform project planning and review, declaring the Plan as a public record and adopting it in its entirety, and adopting a complementary amendment to the Design Standards & Policies Manual (DSPM) to incorporate the Plan by reference.

SUMMARY

Staff Recommendation

Adopt Development Review Board Resolution No. 10.

Items for Consideration

- Conformance with the adopted City of Scottsdale General Plan 2035
- Consistency with and advancement of the Character and Design goals and policies of the General Plan 2035
- Appropriateness of the Plan as citywide design guidance for shade infrastructure
- Clarity and usefulness of the Plan in project planning and design review
- Integration with existing City codes, policies, and design review tools
- Consideration of public, stakeholder, and Board/Commission input

APPLICABILITY

Citywide

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BACKGROUND

Scottsdale has had a long established regulatory and design framework for trees, landscaping, and shade considerations through the Zoning Ordinance and the Design Standards & Policies Manual (DS&PM), which guide site plan and landscape plan review. Approved landscape plans for commercial and municipal sites serve as a long-term resource to confirm that specified tree species, landscaping materials, and their approved locations are maintained over time. While the City already has a range of practices and requirements in place, a centralized shade guidance document can improve coordination and consistency in how shade is considered and implemented over time.

In June 2022, the City, in partnership with Arizona State University's Urban Climate Research Center, published the *Identifying Strategies for a Cooler Scottsdale* study. The study reinforced the value of expanding tree canopy, reducing heat absorbed by hot surfaces, and improving pedestrian shade through both trees and shade structures.

Development of the Plan began in early 2024 and included data analysis, best practices research, and community engagement. On December 12, 2024, staff introduced preliminary Shade & Tree Plan guideline concepts to the Development Review Board and received initial discussion focused on implementation and integration, including how the guidelines may be used during the design review process, how they would align with existing City guidelines, their ability to provide guidance on appropriate tree selection, and how practical constraints such as utility easements are addressed.

The resulting *Shade & Tree Plan for the Built Environment* (the Plan) frames trees, shade structures, and related shade strategies not only as design features, but also as components of city infrastructure (*Attachment 1*). The Plan does not replace or supersede applicable requirements of the Zoning Ordinance, but instead provides practical design guidance to further support, expand, and maintain the provision of shade as necessary infrastructure across Scottsdale's built environment. To support consistent application over time, staff prepared a draft DS&PM amendment to reference the Plan as an additional design resource that is expected to be utilized for use during design review (*Exhibit A to Attachment 2*).

SHADE & TREE PLAN FOR THE BUILT ENVIRONMENT

Plan Organization

The *Shade & Tree Plan for the Built Environment* is intended to guide Scottsdale in maintaining, increasing, and collaborating on shade across the community. The Plan treats shade as infrastructure, fundamental to daily life in Scottsdale, and provides practical guidance for how shade resources can be integrated over time throughout Scottsdale's built environment, including private development sites, public infrastructure, and civic spaces.

The Plan defines Shade Infrastructure as an interconnected system of trees, water-harvesting practices, and shade structures. As such, the document is organized around guidelines for each of those components:

- **Tree Guidelines** (pages 29 – 56 of the draft Plan) outline expectations for selecting, placing, establishing, and maintaining trees suited to Scottsdale's desert conditions. Rather than prescribing a single species or approach, they establish consistent, citywide expectations for a healthy, durable canopy. This section is organized into seven topics,

including, Tree Placement, Soil Volume, Tree Diversity, Tree Selection, Tree Staking, Efficient Watering Strategies, and Tree Pruning & Maintenance.

- **Water Harvesting Guidelines** (pages 57 – 75 of the draft Plan) outline expectations for stormwater capture, infiltration performance, and integration with site design. This section is organized into three topics, including Location & Application, Stormwater Context & Performance, and Maintenance & Longevity.
- **Shade Structures Guidelines** (pages 77 – 87 of the draft Plan) outline expectations for shade coverage, performance, and material resilience. This section is organized into three topics, including Functional Design & Orientation, Integration & Context, and Materials & Maintenance.

In addition to these citywide guidelines, the Plan includes Design Scenarios (pages 89 – 97 of the draft Plan) that illustrate how trees, water-harvesting practices, and shade structures may be applied in different settings. These scenarios are intended to help translate the document's guidance into more visual, applied examples and to demonstrate how shade infrastructure can be layered to respond to site context, pedestrian activity, and project type.

While the Plan is written to apply citywide, it also recognizes that certain areas may warrant more tailored direction due to their intensity of use, pedestrian activity, and established character. As such, the Plan includes an Old Town Scottsdale Character Area (OTSCA) section (pages 99 – 104 of the draft Plan) that provides more location-specific guidance for one of Scottsdale's most walkable, visitor-serving, and publicly active areas. The OTSCA section is intended to supplement the broader citywide guidance with direction responsive to the area's compact urban form, streetscape rhythm, and pedestrian environment.

Design Review and Application

The Plan and its associated guidelines are intended to function as a practical design reference for:

- Private development applicants, to inform site planning and design decisions related to shade infrastructure early in project design, and
- City project teams, including streetscape and capital project planning.
- Residents and community members, to understand best practices and provide informed input during project review and neighborhood discussions

If adopted, the Plan will serve as a shared design reference during review, used alongside the Zoning Ordinance, the Design Standards & Policies Manual, and other applicable City requirements and guidelines to inform how shade infrastructure is incorporated into a proposed project. As such, the design community and staff alike would use the Plan during plan review as an additional design resource when evaluating how shade infrastructure is incorporated into site planning, landscape design, and pedestrian-oriented spaces.

DEVELOPMENT REVIEW BOARD ROLE + ANALYSIS

Development Review Board Role & General Plan Consistency

The Development Review Board reviews the design components of development plans and their relationship to the surrounding environment and broader community in accordance with its adopted criteria. In addition, the Development Review Board may adopt by resolution design policies and guidelines that support the character and design goals and policies of the General

Plan. As such, consideration of the *Shade & Tree Plan for the Built Environment* is before the Development Review Board as a document intended to function as citywide design guidance for shade as it relates to site planning and the quality and comfort of the built environment.

The proposed Plan is consistent with, and helps implement, multiple elements of the Scottsdale General Plan 2035, including Character & Design, Open Space, Environmental Planning, Recreation, Cost of Development, Community Involvement, and Public Services & Facilities. Most directly, and within the Development Review Board's design-related purview, the Plan advances the Character & Design Element by establishing citywide guidance for how shade infrastructure may be incorporated into site planning, streetscapes, and public spaces in a manner that is responsive to context, usability, long-term function, and community character.

Of relevance to the Board's consideration of this action, Character & Design Element goals emphasize appropriateness of development in relation to context (Goal CD 1), fostering quality design through development review (Goal CD 3), enhancing the design of streets and public spaces (Goal CD 4), and promoting the value and visual significance of landscaping in shaping community character (Goal CD 5). Consistent with that direction, the Plan provides a coordinated framework for trees, water-harvesting practices, and shade structures that respond to site conditions, surrounding development patterns, pedestrian activity, and area-specific character, while promoting comfort, visual quality, and long-term function in the built environment. The Plan also reinforces the role of landscape design and shade infrastructure as integral components of Scottsdale's streetscapes, public spaces, and overall community character.

PUBLIC PARTICIPATION, BOARDS, COMMISSIONS

Public participation and review of the draft *Shade & Tree Plan for the Built Environment* occurred through multiple opportunities intended to provide broad community input, focused technical feedback, and input from City Boards and Commissions whose purview is related to this initiative.

Public comment opportunities included:

- An online comment forum was available from February 27 through April 17, 2026,
- A focus group composed of local development teams and landscape architects was held on March 24, 2026,
- Two in-person open house events were held on March 26, 2026, at Mountain View Community Center and the Community Design Studio.

Public comments collected through these opportunities are provided in *Attachment 3*.

In addition, the draft Plan was presented for public review and comment at several city Board and Commission meetings:

- Development Review Board on March 5, 2026,
- Parks and Recreation Commission on March 18, 2026,
- Neighborhood Advisory Commission on March 25, 2026, and
- Scottsdale Environmental Advisory Commission on April 15, 2026.

Comments from Boards and Commissions are provided in *Attachment 4*. The attachment includes comments received during publicly noticed meetings where the draft Plan was included as an agendized item, as well as individual comments submitted by Commissioners outside of a meeting setting. Comments submitted outside of a meeting are identified separately in the

attachment as individual Commissioner comments and are not presented as comments on behalf of the full Board or Commission.

Collectively, these efforts provided multiple opportunities for the public, stakeholders, and Board and Commission members to review the draft document and provide comments for consideration prior to Development Review Board action.

Redline Draft and Next Steps

Attachment 1 contains a redline version of the Shade & Tree Plan for the Built Environment identifying proposed revisions since the draft Plan was presented to the Development Review Board on March 5, 2026. The revisions reflect staff and consultant review and consideration of input received to date to ensure clarity, consistency, and technical accuracy.

The following summarizes proposed revisions as a result of input received to date:

- Introduction and Goals, pages 21–25: Refined terminology related to shaded areas, incorporated language regarding inspection and compliance into the draft Objectives, and expanded language to address generalized, desired shade canopy coverage.
- Tree Guidelines, pages 31–41: Updated tree spacing, soil volume and quality, and tree diversity guidance to improve consistency with the Design Standards and Policies Manual (DS&PM) while reflecting site-specific implementation considerations, and, corrected technical references within the Tree Guides.
- Tree Guidelines page 35, Water Harvesting Guidelines page 68, and Glossary pages 110-111: Clarified terminology related to suspended pavement systems and soil cells for consistency with other sections of the Plan and align with industry terminology.
- Shade Structure Guidelines, pages 78 and 82: Refined terminology related to shade connectivity and updated section language to improve readability, consistency, and clarity regarding shade types and shade structure performance.
- Design Scenarios, pages 89–94: Expanded introductory paragraph to clarify section intent, updated section color palette to discern from other sections of the Plan, and updated illustrative figures to more accurately depict suspended pavement systems and their relationship to surrounding base materials.
- Old Town Scottsdale Character Area Guidelines, pages 99–104: Revised terminology to improve consistency with the Old Town Scottsdale Character Area Plan and related adopted planning documents.
- Appendix, pages 108–113: Updated glossary terminology specific to 30/20/10 Rule (related to tree diversity guidance), and Soil Cell and Suspended Pavement (related to soil volume), and added the Transportation Action Plan (2022) to the list of related plans and policies.
- General edits throughout: Minor text, formatting, graphic, and terminology edits to improve clarity, reduce potential confusion, and maintain consistency throughout the document.

If adopted, staff will prepare a clean, public-facing version of the document incorporating all revisions approved by the Board, including any additional changes directed at the adoption hearing. That clean version will constitute the adopted Plan used to inform project planning and design review.

STAFF RECOMMENDATION

Recommended Approach

Staff recommends that the Development Review Board adopt Development Review Board Resolution No. 10, adopting the Shade & Tree Plan for the Built Environment (the Plan) as citywide design guidance for shade infrastructure to inform project planning and review, declaring the Plan as a public record and adopting it in its entirety, and adopting a complementary amendment to the Design Standards & Policies Manual (DSPM) to incorporate the Plan by reference.

APPROVED BY

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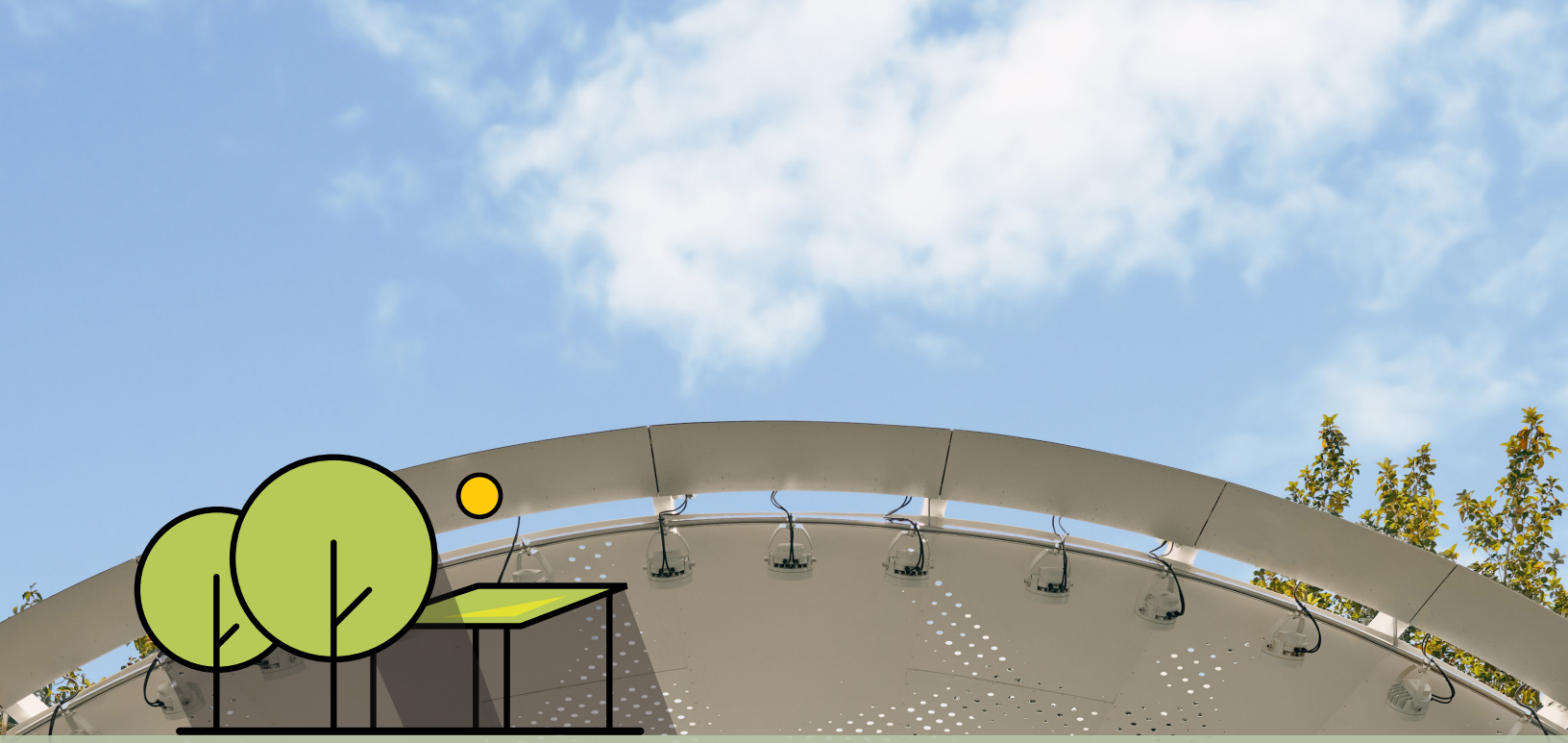
ATTACHMENTS

1. Shade & Tree Plan for the Built Environment – Redline Version
2. Development Review Board Resolution No. 10
   Exhibit A – Amendment to the Scottsdale Design Standards & Policies Manual
3. Public Participation Comment Matrix
4. Board & Commission Comment Matrix



SHADE & TREE PLAN FOR THE BUILT ENVIRONMENT

CITY OF SCOTTSDALE

RESOLUTION NO. 10
ADOPTED MONTH DAY, 2026

February 2026 Draft
Includes tracked edits resulting from PUBLIC and BOARD/COMMISSIONS input.

If adopted at the May 7, 2026 Development Review Board meeting, a clean, public-facing version of the Plan will be prepared to incorporate all Board-approved revisions and will serve as the adopted Plan for future project planning and design review.

ACKNOWLEDGMENTS

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INTRODUCTION

WHY A SHADE & TREE PLAN?

The Scottsdale Shade & Tree Plan for the Built Environment document is a resource developed to help the community maintain, increase, and collaborate on shade infrastructure across our desert city. Shade infrastructure is an integrated system—trees, water-harvesting practices, and shade structures—to cool Scottsdale, improve comfort, and strengthen long-term resilience. Through public outreach and citywide analysis, it has been determined that shade infrastructure is fundamental to daily life in Scottsdale. This Plan provides practical guidance for how shade resources can be integrated into the community over time, applying across Scottsdale's built environment, spanning public infrastructure and civic spaces and private development sites.

The Scottsdale Shade & Tree Plan for the Built Environment document serves as an implementation item of Scottsdale General Plan 2035, which emphasizes effective operations, maintenance, and resource investment in community facilities and vegetation; the expansion of tree canopy and shade infrastructure; and broad-based community engagement to achieve community objectives. The Plan also responds to findings from the *Identifying Strategies for a Cooler Scottsdale* study, which highlighted the need for enhanced shade and cooling strategies throughout the community.

What this Plan is

- A strategic, design-oriented framework to maintain and expand shade infrastructure citywide.
- Practical guidance for selecting and placing trees, integrating water-harvesting practices, and using shade structures across different locations, site types and contexts.
- A resource that can inform more detailed, site-specific plans and project designs.

What this Plan <u>is not</u>

- A regulatory ordinance or replacement for adopted codes, engineering standards, or other City policies.
- A streetscape or construction plan that prescribes exact tree locations, spacing, or project-level designs for individual corridors or sites.
- A guarantee of City funding, installation, or maintenance for any specific site, project, or neighborhood.

This Plan is intended to enhance shade infrastructure citywide by optimizing shade elements and focusing on the selection and placement of appropriate shade infrastructure in public and private spaces. Through actionable strategies and guiding practices, it supports the creation of heat-resilient properties and neighborhoods for residents, businesses, developers, and visitors.

Plan Process & Outreach

Development of the Scottsdale Shade & Tree Plan for the Built Environment document began in early 2024 through a collaborative and data-informed process designed to reflect community priorities and Scottsdale's unique desert context. The effort focused on understanding existing shade conditions, identifying opportunities for improvement, and ensuring strategies that would be both practical and effective over the long term.

Research included analysis of tree canopy distribution, surface heat data, and historical temperature trends, complemented by best practices from other desert cities and regional partners. These sources helped establish a foundation of existing conditions and needs related to shade, comfort, and resilience.

Extensive public engagement was central to shaping the Plan. Through six pop-up events and two open houses held in south and north Scottsdale, more than 1,000 residents and community members were asked a simple question: "Where do we need shade?" The response was consistent and emphatic—the community wants shade everywhere.

Residents identified neighborhoods, parks, paths and trails, and public or shared spaces as top priorities for additional shade. Many also emphasized the importance of selecting appropriate, desert-adapted tree species and maintaining a strong commitment to water efficiency. This feedback guided the creation of practical, balanced strategies that maintain, expand, and encourage collaboration on shade infrastructure citywide.

The Plan transforms data, design guidance, community feedback, and best practices into actionable strategies that advance Scottsdale's shade goals. These strategies work collectively to maintain existing assets, expand shade citywide, and strengthen collaboration on care and maintenance.

Public pop-up event.

Public open house.

UNDERSTANDING HEAT

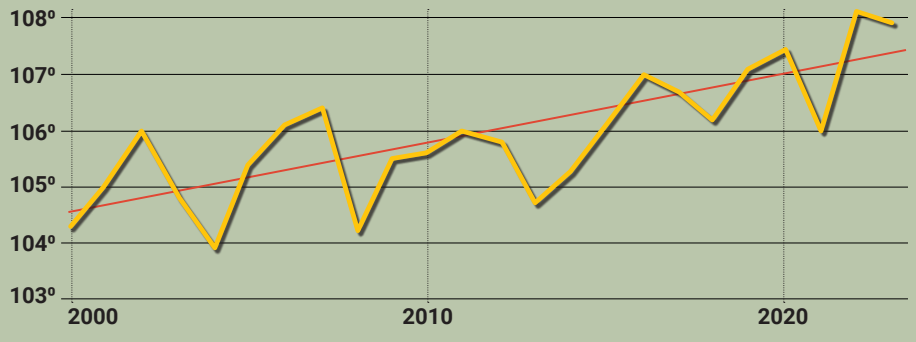
On average, Scottsdale generally experiences 314 days of clear skies each year, resulting in roughly 3,870 hours of direct sunlight. During the longest summer days, the city receives up to 14 hours of daylight, elevating temperatures that peak in July and August, when heat reaches its most extreme levels.

Heat continues to shape life across the Valley. In 2023, the region recorded both record-breaking summer temperatures and the highest number of heat-related fatalities on record AS REPORTED BY MARICOPA COUNTY HEALTH. Globally, it was also the hottest year documented. These conditions reflect a long-term trend in the Sonoran Desert, where communities like Scottsdale have experienced steadily rising average temperatures for more than a century.

Yet averages alone don't tell the full story. The city now faces longer, more frequent heat waves and warmer overnight lows, which compound the effects of daytime highs. The result is prolonged periods of heat that impact daily life around the clock.

Extreme heat places strain on public health systems, increases utility costs, and discourages outdoor activity. For desert cities, addressing heat is not just about comfort—it is essential to resilience, livability, and long-term prosperity.

Figure 0-1. Average July High Temperature, Scottsdale



Source: National Oceanic and Atmospheric Administration (NOAA)

Impact of Shade

Shade plays a critical role in moderating surface and ambient temperatures. Providing shade over heat-absorbing surfaces - such as pavement, walls, and turf - can significantly improve comfort and safety in outdoor spaces. For example, the City of Phoenix Cool Pavement and Cool Corridor Programs found that shaded pavements were up to 12°F cooler than unshaded ones during the day (phoenix.gov).

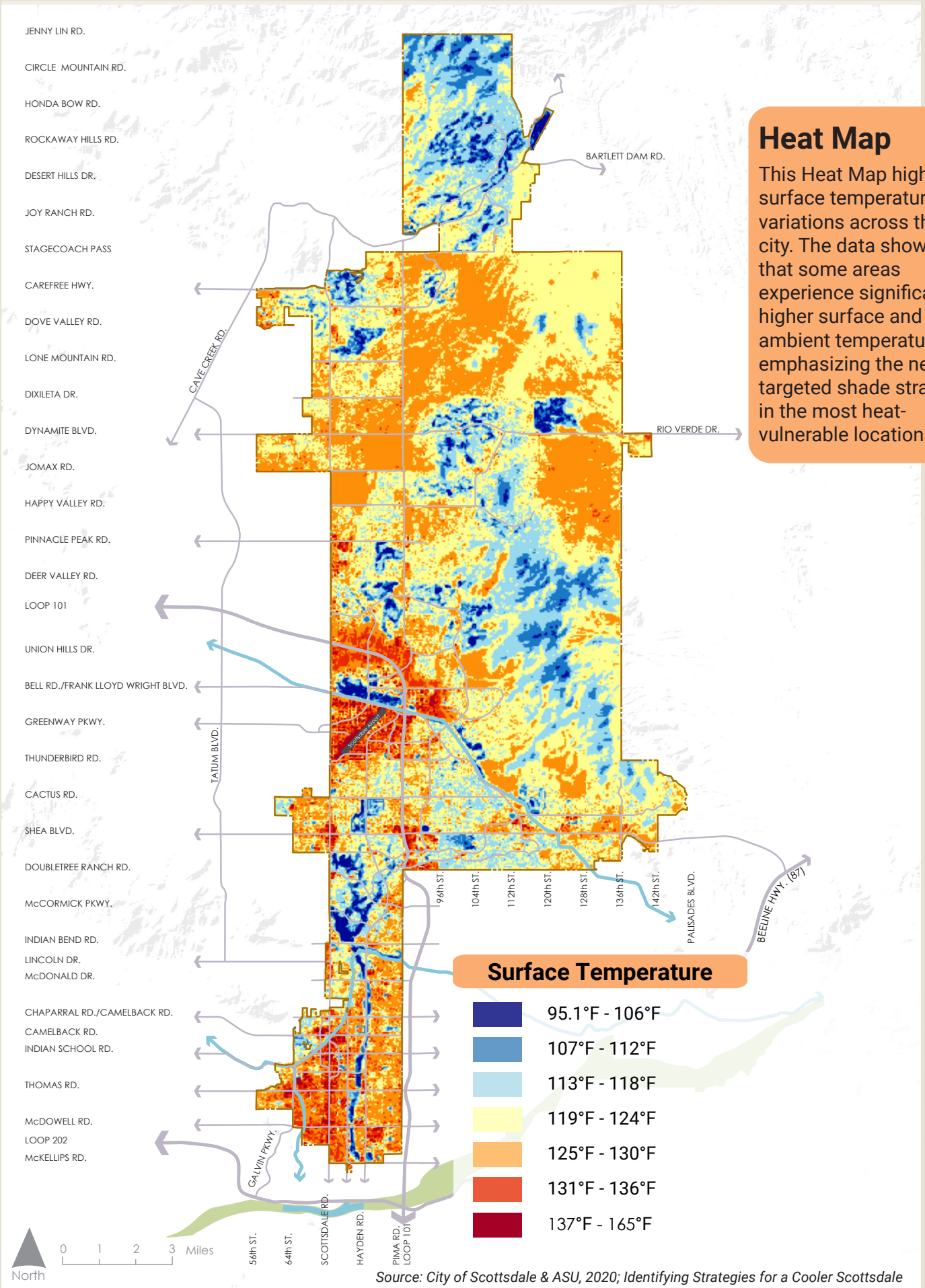
By recognizing how surface materials respond to sunlight, developers, business owners, and residents can make informed decisions about trees, structures, and materials that reduce heat exposure. Thoughtful integration of natural and built shade improves outdoor comfort, reduces energy demand, and enhances Scottsdale's unique character.

Understanding how heat interacts with Scottsdale's built and natural environments also helps reveal where shade is most needed. By mapping surface temperatures and existing shade coverage, patterns emerge—showing areas that stay significantly hotter throughout the day and those already benefiting from shade. The maps on the following pages illustrate these conditions citywide, providing the foundation for how and where shade and cooling strategies can be focused.

Heat-Absorbing Surfaces

In Scottsdale's summer heat, materials such as concrete, asphalt, and artificial turf absorb and retain large amounts of solar energy, reaching temperatures far above the surrounding air. These surfaces intensify heat in outdoor spaces and highlight the need for effective shade to reduce exposure and improve comfort.

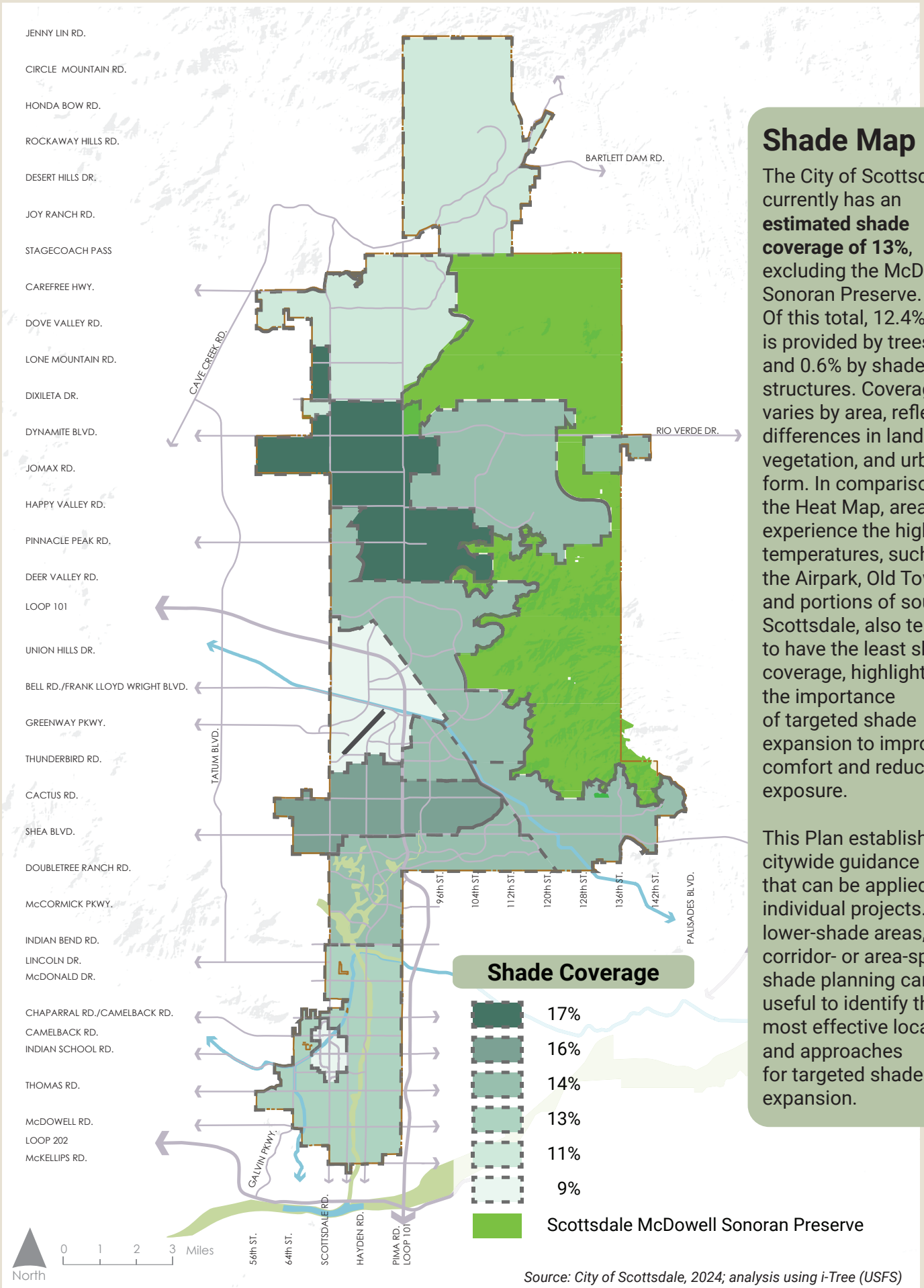
Figure 0-2. Surfaces vary in heat retention.



Heat Map

This Heat Map highlights surface temperature variations across the city. The data shows that some areas experience significantly higher surface and ambient temperatures, emphasizing the need for targeted shade strategies in the most heat-vulnerable locations.

Source: City of Scottsdale & ASU, 2020; Identifying Strategies for a Cooler Scottsdale



Shade Map

The City of Scottsdale currently has an **estimated shade coverage of 13%,** excluding the McDowell Sonoran Preserve. Of this total, 12.4% is provided by trees and 0.6% by shade structures. Coverage varies by area, reflecting differences in land use, vegetation, and urban form. In comparison with the Heat Map, areas that experience the highest temperatures, such as the Airpark, Old Town and portions of south Scottsdale, also tend to have the least shade coverage, highlighting the importance of targeted shade expansion to improve comfort and reduce heat exposure.

This Plan establishes citywide guidance that can be applied on individual projects. In lower-shade areas, future corridor- or area-specific shade planning can be useful to identify the most effective locations and approaches for targeted shade expansion.

Source: City of Scottsdale, 2024; analysis using i-Tree (USFS)

BENEFITS OF SHADE INFRASTRUCTURE

Shade infrastructure, *an interconnected system of trees, shade structures, and water-harvesting practices*, creates a cooler, healthier, and more resilient Scottsdale. Together, these elements reduce heat, improve comfort, and support both environmental and community well-being.

Trees are the cornerstone of a shade system, providing natural cooling through and evapotranspiration while improving air quality and supporting biodiversity. Trees filter pollutants, create habitat for wildlife, and enhance neighborhood character and comfort.

Water harvesting sustain~~in~~s landscapes and reduces reliance on potable water. By capturing and reusing rainfall, it supports plant health, replenishes groundwater, and helps manage stormwater runoff—vital functions in Scottsdale's arid climate.

Shade structures complement the city's urban canopy by extending comfort to areas where trees may not thrive or provide sufficient coverage. Well-placed structures reduce surface and air temperatures, protect people and materials from ultraviolet (UV) exposure, and encourage outdoor activity throughout the year. These structures also contribute to economic value by lowering energy use, extending the lifespan of outdoor surfaces, and enhancing the usability of public spaces.

Scottsdale's Shade & Tree Plan for the Built Environment promotes desert-adapted and native trees, efficient irrigation, and the strategic use of shade structures to balance comfort with long-term resource management, while remaining adaptable as new research, materials, and technologies improve performance over time. Collectively, these tools form an integrated approach to shade infrastructure—one that cools the city, strengthens ecological systems, and enhances livability across Scottsdale.

Trees

Trees contribute to creating cooler, healthier, and more resilient communities. They provide shade that reduces the urban heat island, lowers energy use, and improves comfort in outdoor spaces. Tree canopies filter air pollutants to improve air quality, while their roots manage stormwater and help prevent soil erosion. Trees also support biodiversity by providing habitat for wildlife, from pollinators to birds. Beyond environmental benefits, they add economic and social value by increasing property appeal, enhancing walkability, and creating welcoming community spaces. Trees contribute to well-being—encouraging outdoor activity, reducing stress, and strengthening neighborhood connections.

Biodiversity

Trees preserve biodiversity by providing habitat for birds, insects, and other wildlife. Trees help protect soil, maintain water quality, and reduce erosion, while mitigating the impacts of extreme heat in urban environments.3 ~~*U.S. Forest Service*~~

Pollution

Trees improve air quality by capturing pollutants such as carbon dioxide and filtering fine particulates. A single mature tree can absorb up to 48 pounds of CO_2 annually2 and remove nitrogen oxides and sulfur dioxide, making neighborhoods cleaner and healthier. ~~*U.S. Forest Service*~~

Economic Value

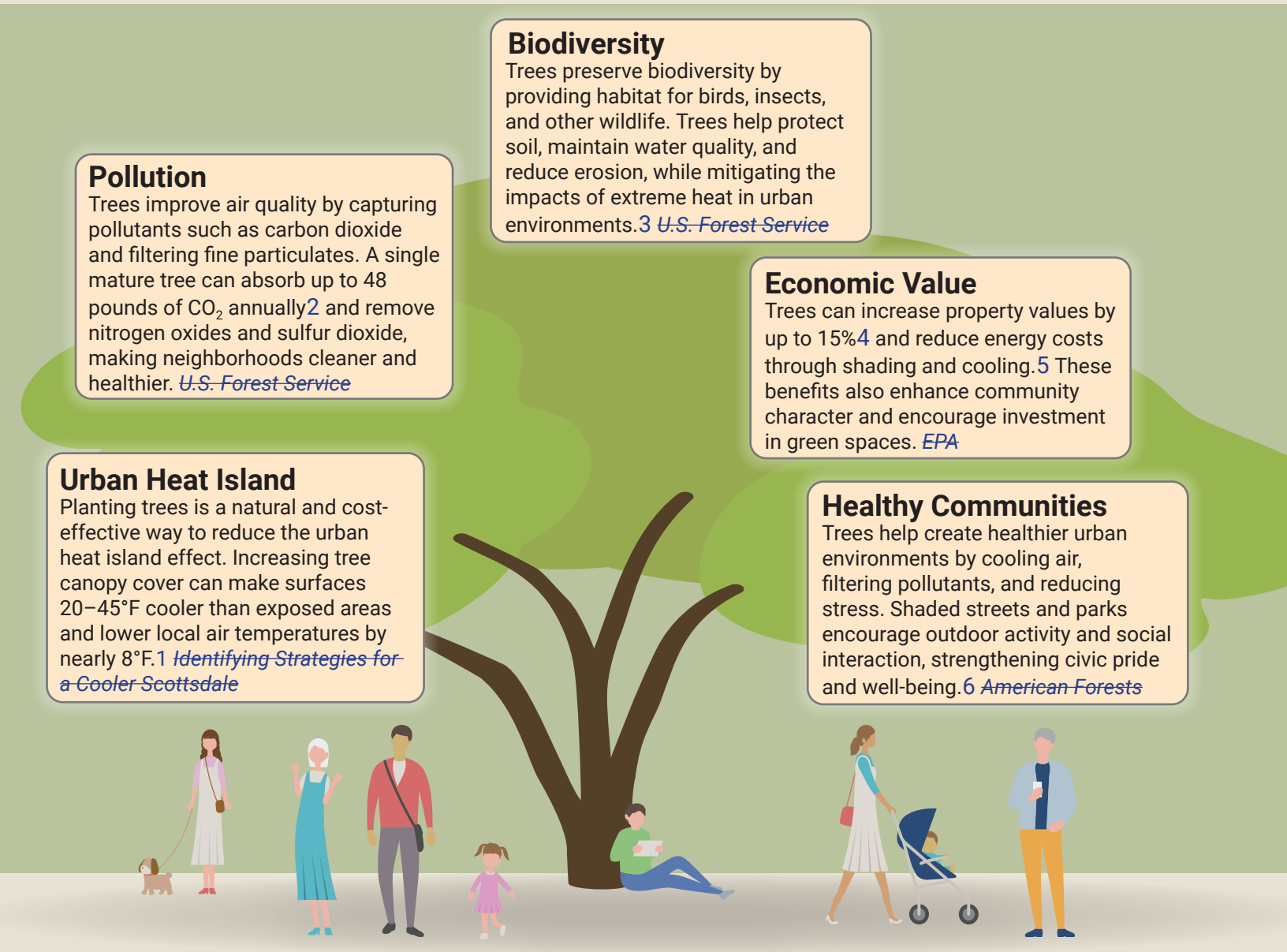
Trees can increase property values by up to 15%4 and reduce energy costs through shading and cooling.5 These benefits also enhance community character and encourage investment in green spaces. ~~*EPA*~~

Urban Heat Island

Planting trees is a natural and cost-effective way to reduce the urban heat island effect. Increasing tree canopy cover can make surfaces 20–45°F cooler than exposed areas and lower local air temperatures by nearly 8°F.1 ~~*Identifying Strategies for a Cooler Scottsdale*~~

Healthy Communities

Trees help create healthier urban environments by cooling air, filtering pollutants, and reducing stress. Shaded streets and parks encourage outdoor activity and social interaction, strengthening civic pride and well-being.6 ~~*American Forests*~~



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Water Harvesting

Water harvesting captures and reuses rainwater to support healthy landscapes, reduce heat, and conserve resources. By directing stormwater into the soil, it reduces runoff, recharges groundwater, and provides a reliable water source for trees and plants. These practices lessen dependence on potable water, improve water quality, and help manage flooding and erosion.

In Scottsdale's arid climate, integrating water-harvesting techniques sustains shade trees, enhances landscape health, and strengthens resilience to heat. Even small-scale efforts, such as contouring soil, directing roof runoff, or using permeable surfaces, can create cooler, greener, and more livable outdoor spaces while easing demand on municipal water supplies.

Cleans Polluted Water

Water harvesting improves water quality by reducing runoff and filtering contaminants through soil and vegetation. This process helps clean stormwater and supports healthier urban watersheds.2 ~~*U.S. Forest Service, Urban Forests and Water Quality*~~

Supports Plant Health

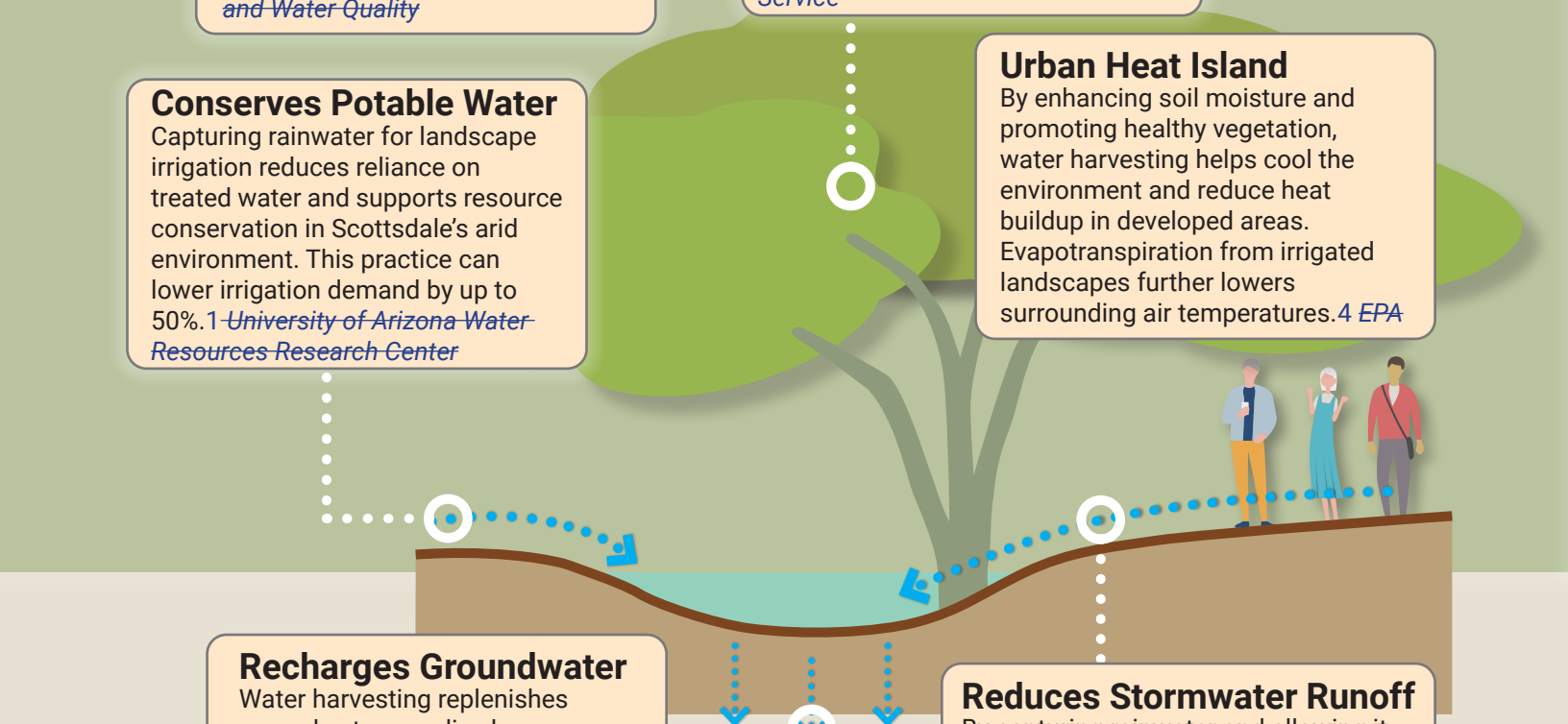
Water harvesting provides a reliable, salt-free source for irrigation, keeping trees and landscapes healthy during dry periods. Maintaining soil moisture helps sustain plant vitality and resilience in arid conditions.3 ~~*U.S. Natural Resources Conservation Service*~~

Conserves Potable Water

Capturing rainwater for landscape irrigation reduces reliance on treated water and supports resource conservation in Scottsdale's arid environment. This practice can lower irrigation demand by up to 50%.1 ~~*University of Arizona Water Resources Research Center*~~

Urban Heat Island

By enhancing soil moisture and promoting healthy vegetation, water harvesting helps cool the environment and reduce heat buildup in developed areas. Evapotranspiration from irrigated landscapes further lowers surrounding air temperatures.4 ~~*EPA*~~



Recharges Groundwater

Water harvesting replenishes groundwater supplies by directing captured rainwater into the soil, supporting long-term water availability. This process is vital for maintaining aquifer levels in desert regions.6 ~~*U.S. Environmental Protection Agency*~~

Reduces Stormwater Runoff

By capturing rainwater and allowing it to infiltrate the soil, water harvesting mitigates runoff and helps prevent flooding and erosion. It also slows the flow of stormwater and promotes groundwater recharge.5 ~~*U.S. Environmental Protection Agency*~~

1. UNIVERSITY OF ARIZONA WATER RESOURCES RESEARCH CENTER. HARVESTING RAINWATER FOR LANDSCAPE USE (2026).
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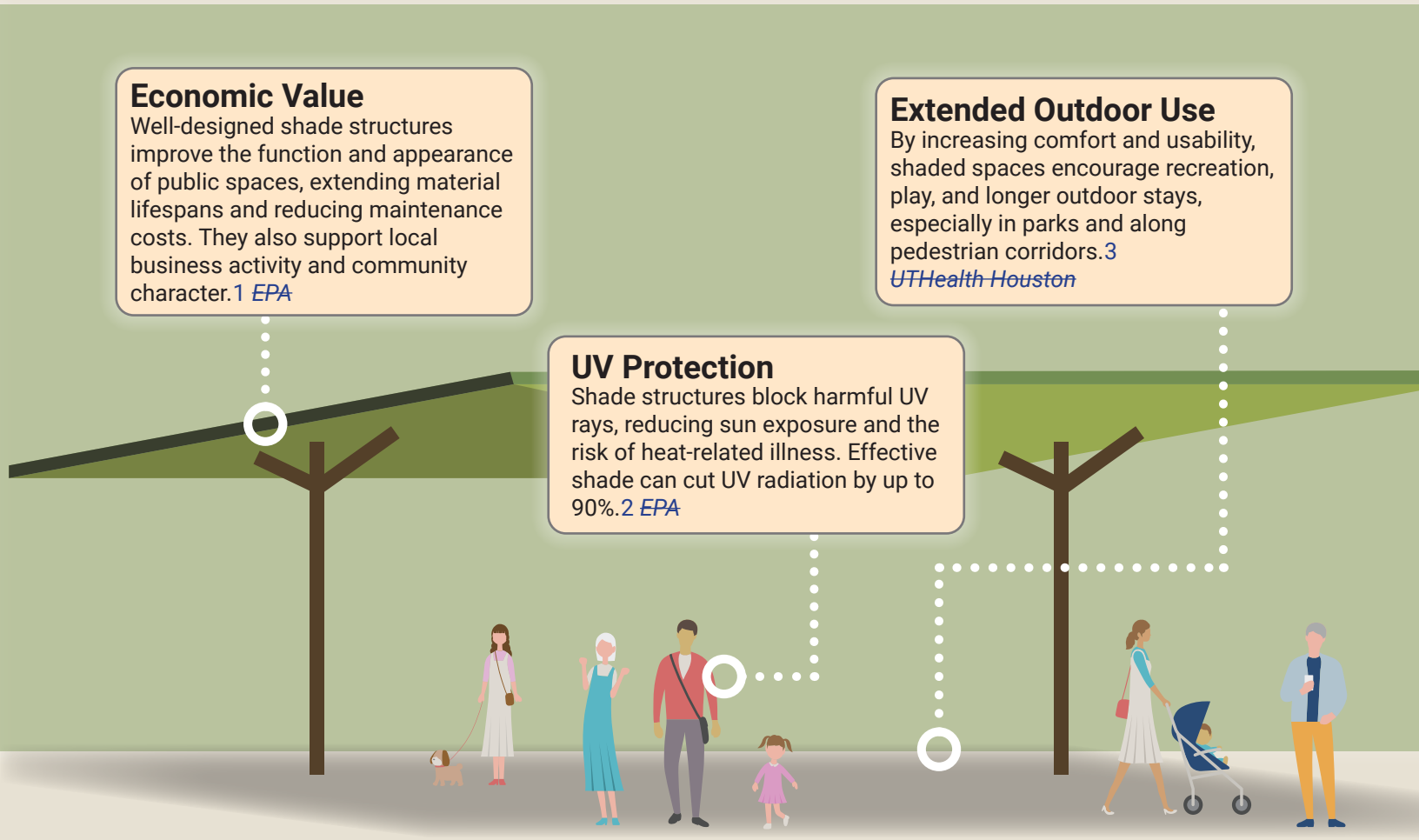
3. U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE. CONSERVATION PRACTICE STANDARD: WATER HARVESTING CATCHMENT, CODE 636 (2020).
4. U.S. ENVIRONMENTAL PROTECTION AGENCY. USING TREES AND VEGETATION TO REDUCE HEAT ISLANDS (2025).
5. U.S. ENVIRONMENTAL PROTECTION AGENCY. WHAT IS GREEN INFRASTRUCTURE? (N.D.).
6. U.S. ENVIRONMENTAL PROTECTION AGENCY. SOAK UP THE RAIN: THE BENEFITS OF GREEN INFRASTRUCTURE (2026).

Shade Structures

Shade structures provide far more than relief from just the sun. They enhance comfort, extend outdoor usability, and add long-term value to public and private spaces. By reducing surface and air temperatures, they make streets, parks, plazas, and gathering spaces more comfortable throughout the year. Shade structures also reduce UV exposure, protecting public health and improving quality of life.

Well-placed shade enhances walkability, encourages recreation, and supports social interaction by making outdoor environments usable even during the hottest months. These improvements promote community engagement, safety, and economic activity. Shade structures also contribute to energy savings by reducing cooling demands for nearby buildings and vehicles, while durable materials and thoughtful design extend the lifespan of outdoor spaces and amenities.



Economic Value

Well-designed shade structures improve the function and appearance of public spaces, extending material lifespans and reducing maintenance costs. They also support local business activity and community character.1 ~~*EPA*~~

Extended Outdoor Use

By increasing comfort and usability, shaded spaces encourage recreation, play, and longer outdoor stays, especially in parks and along pedestrian corridors.3 ~~*UTHealth Houston*~~

UV Protection

Shade structures block harmful UV rays, reducing sun exposure and the risk of heat-related illness. Effective shade can cut UV radiation by up to 90%.2 ~~*EPA*~~

Energy Savings

Shade around buildings, parking areas, and walkways lowers surface and vehicle temperatures, decreasing cooling costs by up to 20%. Solar-integrated canopies can further enhance efficiency by generating renewable energy.5 ~~*U.S. Forest Service*~~

Heat Reduction

Shade structures lower surface temperatures by 20–45°F, making outdoor areas cooler and more comfortable while reducing the urban heat island effect.4 ~~*NOAA*~~

1. U.S. ENVIRONMENTAL PROTECTION AGENCY. USING TREES AND VEGETATION TO REDUCE HEAT ISLANDS (2025).
2. U.S. ENVIRONMENTAL PROTECTION AGENCY. USING TREES AND VEGETATION TO REDUCE HEAT ISLANDS (2025).
3. URBAN LAND INSTITUTE. TEN PRINCIPLES FOR BUILDING HEALTHY PLACES (2013).
4. U.S. DEPARTMENT OF COMMERCE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION. URBAN HEAT ISLAND. (N.D.).
5. U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE. QUANTIFYING URBAN FOREST STRUCTURE, FUNCTION, AND VALUE URBAN FORESTS (1997).

SHADE & WATER

Ongoing drought conditions and rising temperatures across the American Southwest make efficient coordination between water use and shade infrastructure important in Scottsdale. Expanding shade coverage must be balanced with responsible water management to reduce heat exposure while conserving limited water resources. An integrated approach combining appropriate tree selection, efficient watering strategies, and water harvesting supports long-term cooling for long-term viability and a livable desert community.

Tree Selection

Prioritize desert-native and desert-adaptive species to expand canopy cover while aligning with Scottsdale's water conservation goals (See Tree Guidelines, pages 37 - 47).

Watering Strategies

Use efficient irrigation methods such as drip systems, smart controllers, and seasonal scheduling to support tree health while minimizing water waste (See Tree Guidelines, pages 51 - 52).

Water Harvesting

Capture and reuse stormwater to supplement irrigation, reduce reliance on potable water, and support tree establishment and long-term growth (See Water Harvesting Guidelines, pages 59 - 75).

Water-Efficient Landscape Design

Grass, Artificial Turf and Trees

Balancing grass, artificial turf, and trees is critical to managing both heat and water use. Natural grass can reduce surface temperatures and retain soil moisture around trees but typically requires more water. Artificial turf conserves water yet can significantly increase surface temperatures, potentially stressing nearby trees. Effective site design strategically combines trees with low-water-use grass species or limited areas of artificial turf to achieve cooling benefits while maintaining water efficiency.

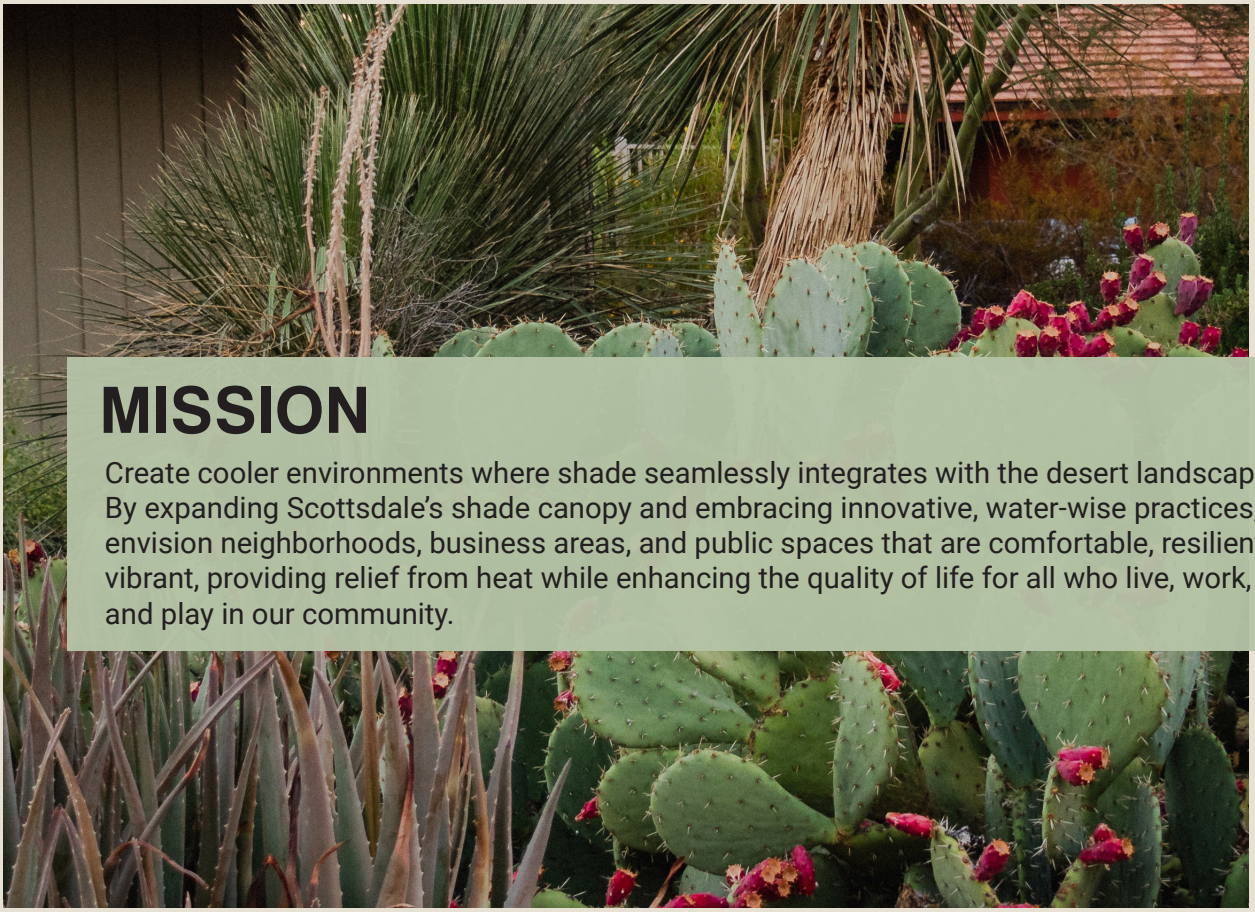
Shifting from Non-Functional Grass to Shade Solutions

Reducing non-functional grass and replacing it with tree canopy, drought-tolerant groundcovers, or shaded seating areas can significantly lower water use while improving outdoor comfort. Tree-shaded areas retain soil moisture more effectively than exposed lawns, requiring less water usage over time. This approach creates cooler microclimates, reduces the urban heat island effect, and delivers long-term water savings without sacrificing usability of outdoor spaces.

Gray Water Considerations

The City of Scottsdale does not actively promote gray water systems, as much of the community's water is already collected, recycled and reused. Scottsdale reuses water for landscape irrigation, energy cooling with valley-wide partners, and aquifer storage for future needs. While gray water harvesting can provide a supplemental water source for trees at a specific site, its overall impact on Scottsdale's water supply is limited given the City's robust existing water recycling efforts.

MISSION, VISION, GOALS

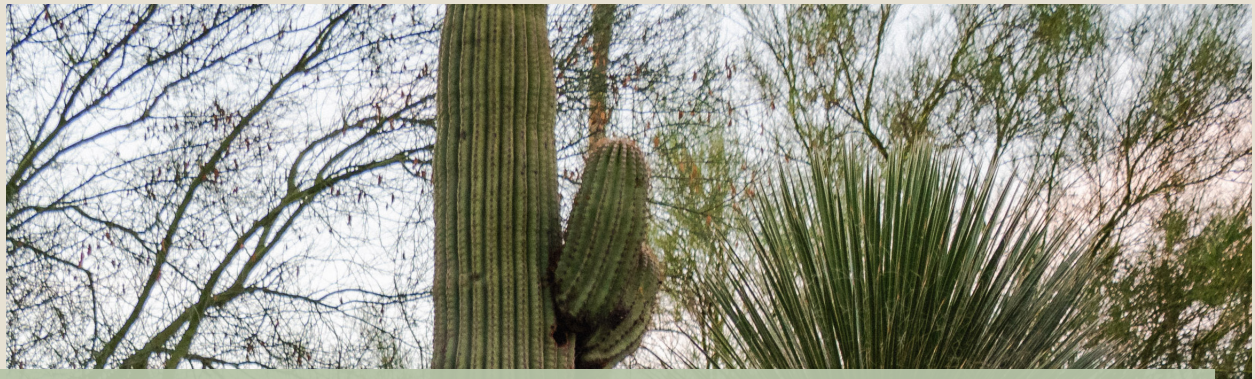


MISSION

Create cooler environments where shade seamlessly integrates with the desert landscape. By expanding Scottsdale's shade canopy and embracing innovative, water-wise practices, we envision neighborhoods, business areas, and public spaces that are comfortable, resilient, and vibrant, providing relief from heat while enhancing the quality of life for all who live, work, visit and play in our community.

VISION

Establish Scottsdale as a model of resilience in modern desert cities, where thoughtfully designed shade infrastructure creates cooler, more livable spaces. By prioritizing long-term solutions and fostering a balanced ecosystem, we envision Scottsdale as a city of comfort, beauty, and environmental stewardship, ensuring a thriving and inviting community for generations to come.



GOALS

The goals of the Scottsdale Shade & Tree Plan for the Built Environment document are centered on creating a cooler and more resilient city. The Plan provides a framework to expand and maintain shade infrastructure—trees, built structures, and water efficient elements. Through its implementation, the Plan aims to deliver long-term community benefits such as reducing heat, supporting biodiversity, lowering energy use, and improving comfort and livability in public and private spaces. The following goals guide Scottsdale's approach to shade: maintaining the city's existing shade infrastructure, increasing shade coverage through thoughtful design and placement, and collaborating with community partners to ensure the continued success of these efforts.

Maintain our Shade:

Preserve and sustain mature trees and other existing shade infrastructure to ensure their long-term health, function, and benefit. Objectives include maintaining and monitoring shade infrastructure, sustaining funding resources, enhancing water efficiency, and ensuring long-term resilience through updated policies and training.

(Cross Reference City of Scottsdale General Plan 2035 Character & Design, Open Space, Environmental Planning, Recreation, and Cost of Development Elements)

Increase our Shade:

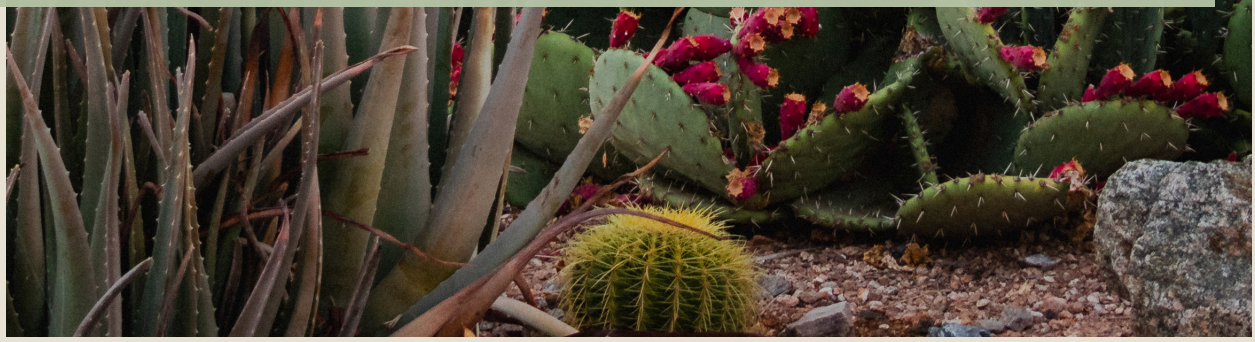
Expand shade infrastructure through strategic placement, thoughtful design, and integration into public and private projects. Objectives focus on expanding the city's tree canopy and shade structures, continuing the incorporation of shade considerations in the development process, and enhancing the aesthetic and functional quality of shade infrastructure.

(Cross Reference City of Scottsdale General Plan 2035 Character & Design, Open Space, and Environmental Planning Elements)

Collaborate on Shade:

Foster partnerships and shared responsibility to sustain and expand ~~the~~ shade ~~network~~. Objectives emphasize education, community awareness, interdepartmental coordination, and participation through private developments, volunteers, and neighborhood-led efforts.

(Cross Reference City of Scottsdale General Plan 2035 Community Involvement and Public Services & Facilities Elements)



MAINTAIN OUR SHADE

Objective 1 **Maintain and monitor existing shade infrastructure.**

1.1 Develop and implement a citywide shade management program that includes periodic condition assessments, maintenance schedules, and long-term replacement planning.

1.2 Maintain an inventory of public trees, structures, and other shade infrastructure.

Objective 2 **Provide programming and collaborative support for shade maintenance.**

2.1 Provide city staff with ongoing maintenance education and training.

2.2 Create public-private partnership opportunities that encourage local businesses and community organizations to invest in and sponsor shade maintenance.

2.3 Partner with local universities or research institutions to test and improve shade maintenance techniques and best practices.

Objective 3 **Ensure long-term shade resilience.**

3.1 Establish a coordinated shade infrastructure program that SUPPORTS INSPECTION AND COMPLIANCE EFFORTS, organizes maintenance priorities, and identifies potential external funding or grant opportunities.

3.2 Regularly review and update policies and guidelines to reflect emerging best practices.

Objective 4 **Enhance water efficiency and conservation.**

4.1 Expand efficient irrigation and water harvesting practices to maintain existing shade infrastructure and offset water needs.

INCREASE OUR SHADE

Objective 1 Expand Scottsdale's shade infrastructure.

1.1 Increase tree canopy and shade structures citywide, prioritizing high-heat, low-canopy, and prominent public areas.

1.2 Strategically select and place trees to maximize shade coverage and ensure longevity.

1.3 Increase shade in the public realm for gathering, walking, and biking.

Objective 2 Integrate shade infrastructure in the development process.

2.1 Recognize shade infrastructure as an essential element of city projects.

2.2 Promote shade infrastructure in private development and redevelopment.

2.3 Apply the Scottsdale Shade & Tree Plan for the Built Environment Guidelines in the design review process.

Objective 3 Enhance the aesthetic and functional quality of shade infrastructure.

3.1 Support shade infrastructure designs that contribute to Scottsdale's visual identity and character.

3.2 Provide technical guidance and examples of successful shade integration in different contexts (Greater Airpark, Old Town, commercial corridors).

3.3 Ensure shade designs increase public comfort and accessibility.

COLLABORATE ON SHADE

Objective 1 **Promote awareness and shared responsibility.**

1.1 Develop education and outreach materials highlighting the benefits of shade and clarifying shared responsibilities for maintenance.

1.2 Offer workshops, guides, and materials on the importance of selecting and implementing appropriate shade infrastructure.

Objective 2 **Strengthen partnerships and shared stewardship.**

2.1 Establish an interdepartmental coordination group to align city shade initiatives with community priorities.

2.2 Build relationships with neighborhoods, HOAs, schools, nonprofits, and businesses to develop support the provision and maintenance of shade infrastructure.

Objective 3 **Support community implementation and participation.**

3.1 Encourage volunteer programs and neighborhood initiatives focused on shade projects.

3.2 Consider offering small-scale grants or tool-lending programs to empower neighborhood-led shade projects.

3.3 Recognize and incentivize community contributions.

ADVANCING CITYWIDE SHADE GOALS

Increasing shade begins with understanding where shade delivers the greatest benefit and how sun exposure shapes daily comfort. Building from the citywide heat and shade baseline, this page summarizes where shade matters most and how to prioritize it.

~~Best Practices for~~ DESIRED **Shade Canopy Coverage**

A key focus of the Scottsdale Shade & Tree Plan for the Built Environment document is expanding citywide shade. The categories below identify high-priority locations with corresponding long-term shade goals. The ranges provided are planning targets—not mandatory, minimum requirements—and may HELP INFORM HOW SHADE PERFORMANCE IS EVALUATED AND COMMUNICATED THROUGH SITE PLANS AND RELATED PROJECT MATERIALS, ~~be applied~~ based on site context, constraints, and project type.

Critical Shade Zones (75–100% Coverage)
Playgrounds, gathering areas, school pick-up/drop-off zones, seating in parks, and bus stops.

Active Use Areas (50–75% Coverage)
Parking lots, streetscapes along major corridors, off-street paths/sidewalks.

Functional Shade Areas (25–50% Coverage)
Commercial areas, streetscapes, residential sidewalks, open spaces in retention basins.

Natural Integration Areas (30–60% Coverage)
Retention basins, green corridors, and other multipurpose areas.

Supplemental Shade Areas (10–25% Coverage)
Industrial areas and residential yards.

Sun Path & Shade Prioritization

Sun orientation is one of the most important drivers of thermal comfort in Scottsdale. Because afternoon sun is most intense, the west and southwest sides of streets, buildings, and public spaces typically create the greatest heat exposure for pedestrians, gathering areas, and building frontages.

Prioritize shade placement where people walk, wait, and linger during peak heat, especially along sidewalks, paths, plazas, transit stops, and entries. When trees are not feasible or need time to mature, shade structures and water-harvesting strategies can help deliver near-term relief and long-term canopy success.

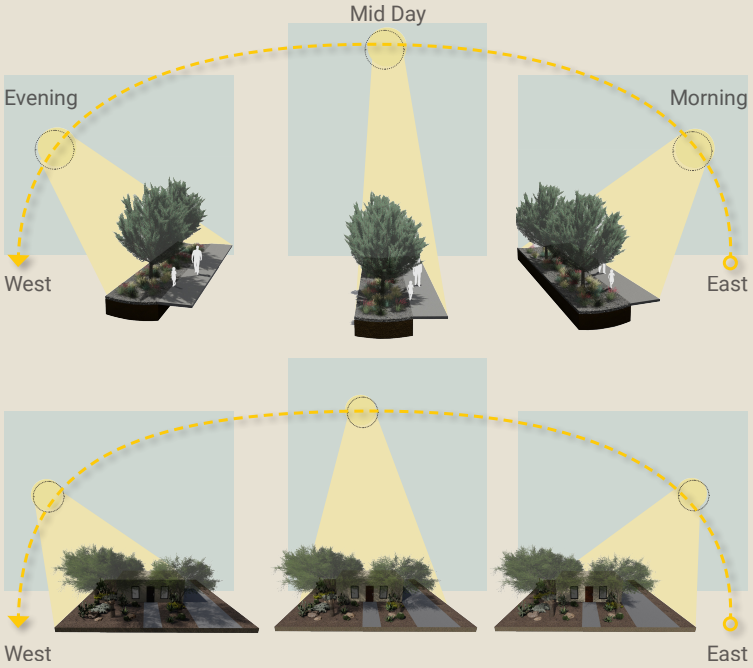


Fig. 0-2 Effective Shade Placement Based on Sun Orientation

THE GUIDELINES

INTRODUCTION TO THE GUIDELINES

Effective shade infrastructure requires a multi-faceted approach that integrates trees, water harvesting, and structures to maximize cooling, comfort, and long-term livability. Each component contributes uniquely to reducing heat exposure and supporting a resilient community.

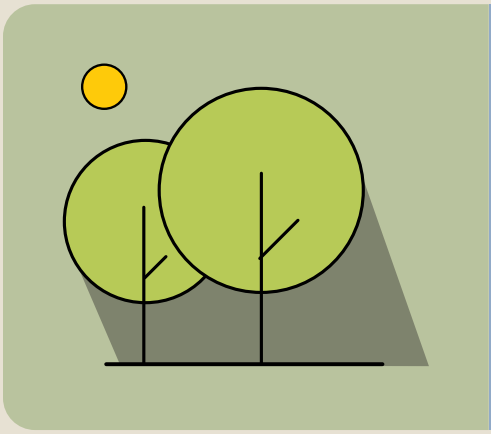
The Guidelines offer a highly visual, easy-to-use resource for residents, developers, planners, and policymakers. Their purpose is to provide clear, practical direction on maintaining and expanding the city's shade infrastructure.

To achieve these goals, the Guidelines refine complex strategies into applicable solutions tailored to Scottsdale's desert context, while the Design Scenarios illustrate how those strategies can be combined on typical sites. The Old Town section further illustrates shade solutions for Scottsdale's most walkable, urban setting, aligning shade infrastructure with the existing character plan and downtown urban design expectations.

Developed collaboratively with multiple city departments and industry experts, the Guidelines reflect Scottsdale's commitment to community-focused solutions that enhance livability and the environment.

Use the icons on this page to navigate directly to each section.

TREES



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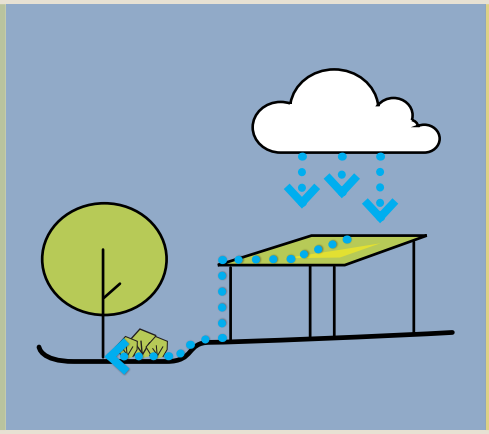
WATER HARVESTING



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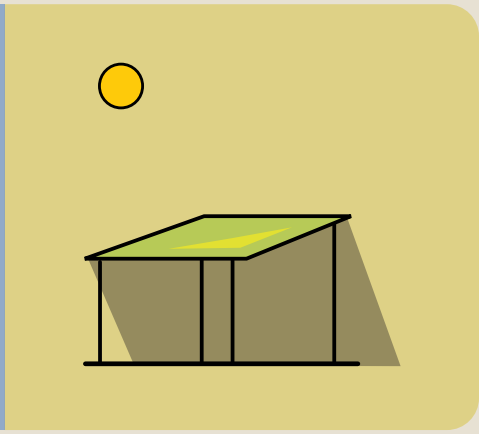
SHADE STRUCTURES



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DESIGN SCENARIOS

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OLD TOWN SCOTTSDALE

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TREES

Trees are the cornerstone of Scottsdale's shade infrastructure, providing natural cooling along with other environmental, economic and aesthetic benefits. They create habitat for wildlife, enhance neighborhood character, and improve comfort in outdoor spaces. In combination with shade structures and water-harvesting practices, trees contribute to a cooler, healthier, and more resilient community.

The Tree Guidelines provide direction for every stage in the life cycle of a tree to promote healthy growth, structural stability, and effective canopy coverage. The guidelines are intended for use by city departments, developers, and design teams to inform project planning and review, ensuring that landscaping contributes to Scottsdale's broader shade goals.

Design and Implementation Framework

The Tree Guidelines outline expectations for selecting, placing, establishing, and maintaining trees that are suited to Scottsdale's desert conditions. Rather than prescribing a single species or approach, they establish consistent, citywide expectations for a healthy, durable canopy.

Working in tandem with the Shade Structure and Water Harvesting Guidelines, the Tree Guidelines form one of the three technical foundations of the Shade & Tree Plan.

The Guidelines provide detailed direction organized under the following seven topics:

Tree Placement outlines how to approach spatial constraints and surrounding context so trees can reach their full canopy without conflicts.

Soil Volume defines the preparation and minimum soil requirements needed to support root growth and canopy health.

Tree Diversity sets the stage for tree selection by prioritizing the use of multiple species for ecological and aesthetic benefits.

Tree Selection offers details for choosing species appropriate to site conditions, spatial constraints, water requirements and maintenance needs.

Tree Staking describes methods to support young trees while allowing natural structural development.

Efficient Watering Strategies identify practices that maximize water efficiency and tree performance.

Tree Pruning & Maintenance establishes standards for canopy maintenance to promote safety, longevity, and aesthetic quality.

Protect Mature Trees

Mature trees are a large part of Scottsdale's existing shade infrastructure. While these guidelines support adding new shade trees to **Increase Our Shade**, it is just as important to protect the trees we already have and **Maintain Our Shade**. The Tree Guidelines are not intended to replace existing mature trees. Whenever feasible, plan and design around mature trees and focus on keeping them healthy and safe.

TREE PLACEMENT

Place trees to maximize shade benefits, ensure long-term tree health, and avoid conflicts with surrounding infrastructure.

TR 1 **FOR PEDESTRIAN AREAS AND STREET FRONTAGES, ensure proper MATURE canopy overlap while allowing sufficient room for growth.**

TR 1.1 A MAXIMUM OF ~~20~~25' measured from trunk to trunk is recommended (~~20~~25' O.C. - on center). REFER TO THE TREE LISTS AND TREE GUIDES BEGINNING ON PAGE 38 FOR RECOMMENDED PLACEMENT ON INDIVIDUAL SPECIES.

TR 1.2 ~~Smaller tree species may be planted closer together.~~ CLOSER SPACING MAY BE EVALUATED FOR SMALLER TREE SPECIES.

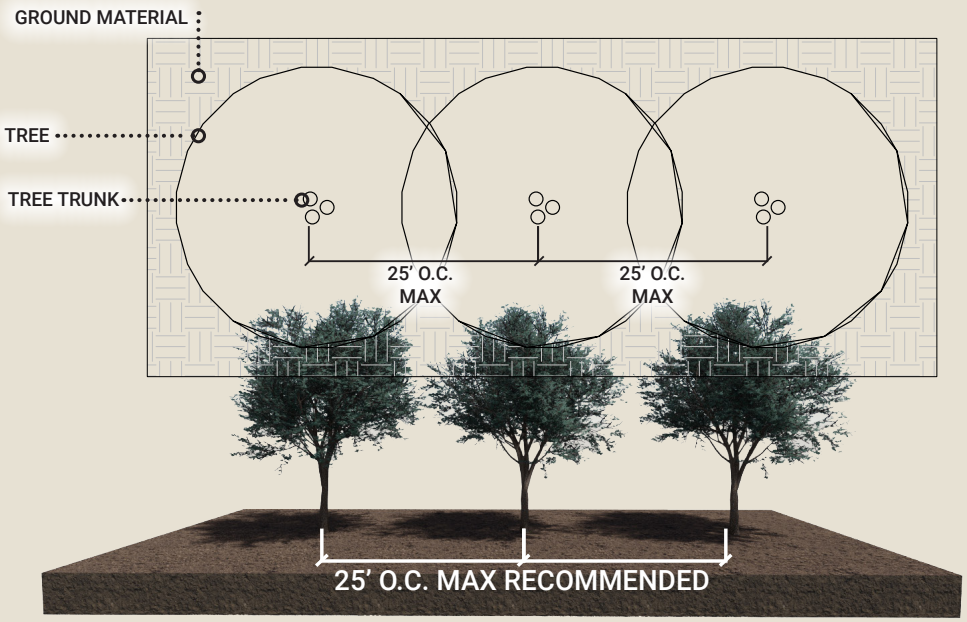


Figure 1-1. Guideline TR1.1

TR 2 **Prevent damage to structures and allow for healthy root and canopy development.**

TR 2.1 10' measured from building/structure to a tree trunk is recommended.

TR 2.2 5' minimum may be appropriate for smaller trees with non-invasive root systems. REFER TO THE TREE LISTS AND TREE GUIDES BEGINNING ON PAGE 38.

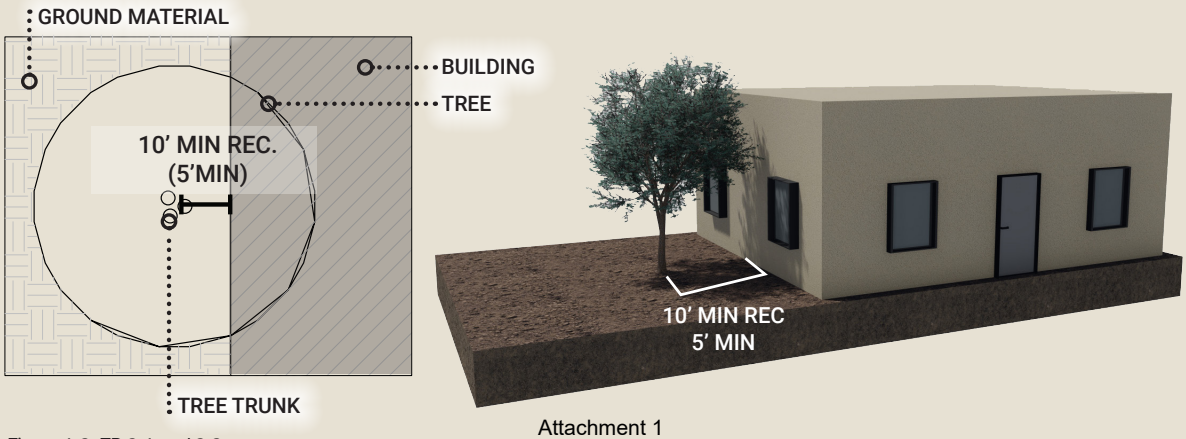


Figure 1-2. TR 2.1 and 2.2

TR 3 Minimize heat retention and reduce the risk of root conflicts with nearby hardscape.

TR 3.1 5’ measured from hardscape to trunk is recommended.

TR 3.2 3.5’ may be acceptable for smaller trees with non-invasive root systems

TR 3.3 PROVIDE A MINIMUM OF 50% SHADE COVERAGE OVER HARDSCAPE SURFACES THROUGH A COMBINATION OF TREES AT MATURITY AND SHADE STRUCTURES.

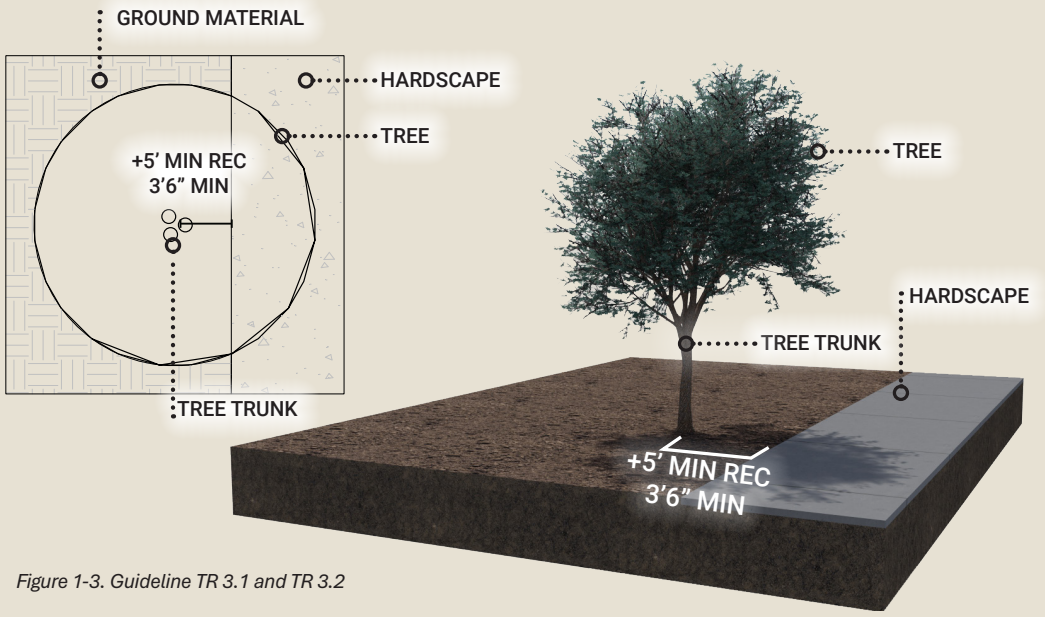
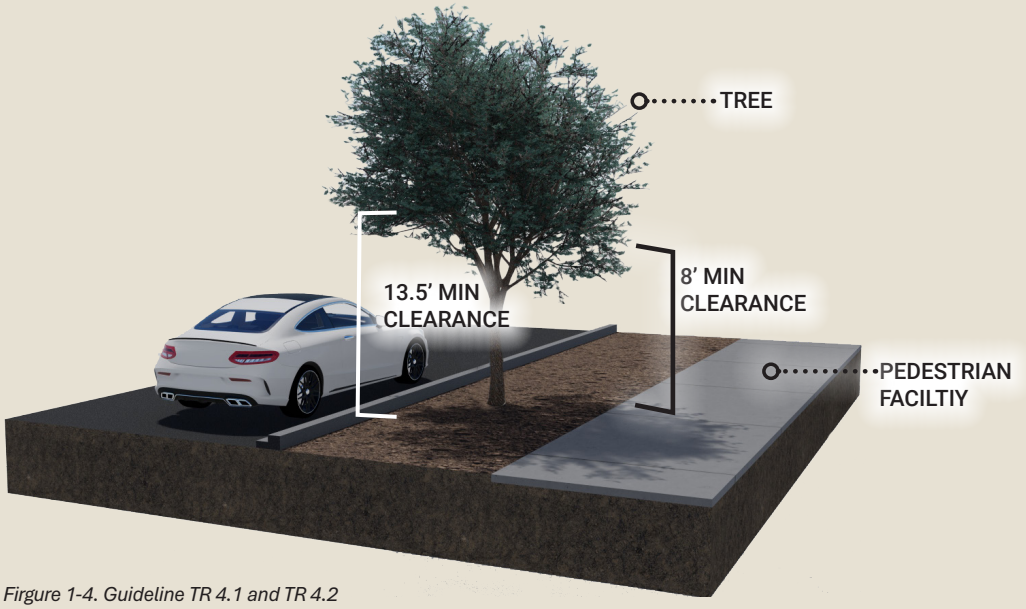


Figure 1-3. Guideline TR 3.1 and TR 3.2

TR 4 Maintain safe sightlines and unobstructed movement.

TR 4.1 8’ clearance from a pedestrian facility (sidewalks, paths, etc.) is recommended at maturity.

TR 4.2 ~~14~~13.5’ VERTICAL CLEARANCE from drivelanes is recommended.



Firgure 1-4. Guideline TR 4.1 and TR 4.2

TR 5 Avoid conflicts with buildings, power lines, underground utilities, drainage systems, and other infrastructure.

TR 5.1 Consult utility providers to avoid conflicts. CALL 811 PRIOR TO DIGGING.

TR 5.2 Use trees with limited invasive roots (Refer to the Tree Lists and Tree Guides beginning on page 38).

TR 5.3 Root barriers may be utilized for added underground protection.

TR 5.4 The trunk of a tree should be 67'+ from underground utilities.

TR 5.5 In areas where trees may not be feasible, evaluate the PRACTICAL use of shade structures.

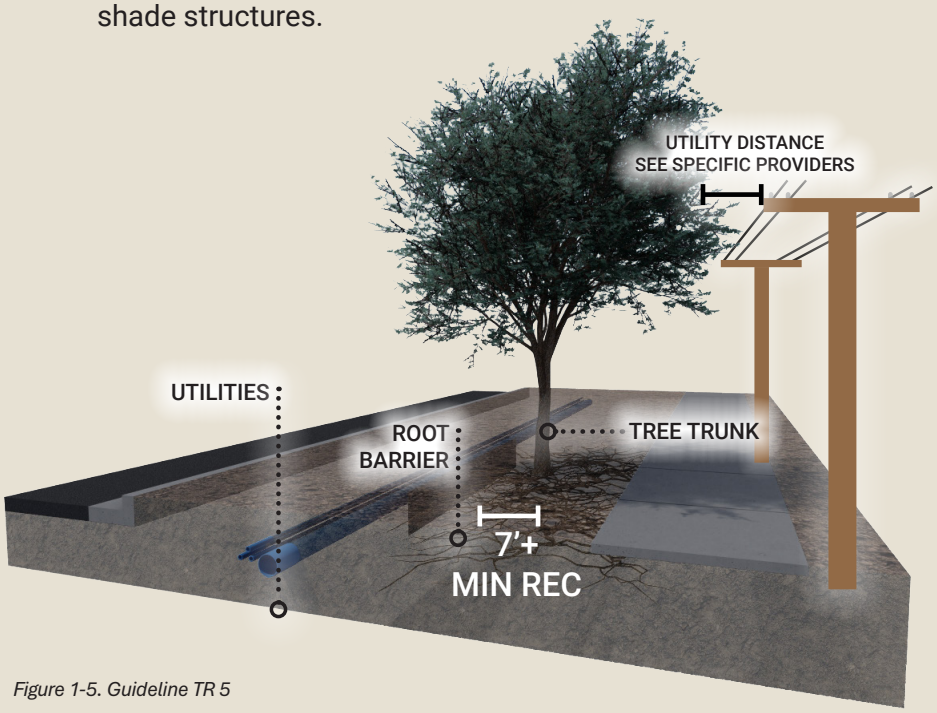


Figure 1-5. Guideline TR 5

TR 6 Prioritize tree placement to provide shade in pedestrian areas.

TR 6.1 Locate trees so mature canopy provides shade along pedestrian routes and connections, including sidewalks, paths, crossings, and primary and secondary building entries.

TR 6.2 Locate trees so mature canopy provides shade where people gather or wait, including seating areas, plazas, playground edges, transit stops, and community facilities.

TR 6.3 Locate trees, or groupings of trees, to minimize large unshaded gaps along pedestrian routes and gathering areas.

TR 6.4 Avoid placing higher-allergen tree species adjacent to seating areas, entries, and other gathering or waiting areas with sustained pedestrian activity.

SOIL VOLUME & QUALITY

Ensure adequate soil volume and quality to support tree growth, health and longevity.

Limited soil volume restricts root expansion, resulting in stunted growth and diminished vitality—a condition often described as "bonsai-ing." Trees under chronic stress are more susceptible to pests and diseases, increasing the need for maintenance and replacement. In urban environments, where soil is frequently compacted or constrained by pavement and structures, providing adequate soil volume is essential to support healthy, mature tree development.

Figure 1-6. illustrates how soil volume directly influences tree size and canopy potential. Trees planted in approximately 120 cubic feet of soil remain substantially smaller than those provided with 500 or 1,000 cubic feet, where they can achieve their full growth potential and contribute meaningful shade.

Additional soil-related considerations, including soil quality, compaction and planting practices, are addressed in the following guidelines.

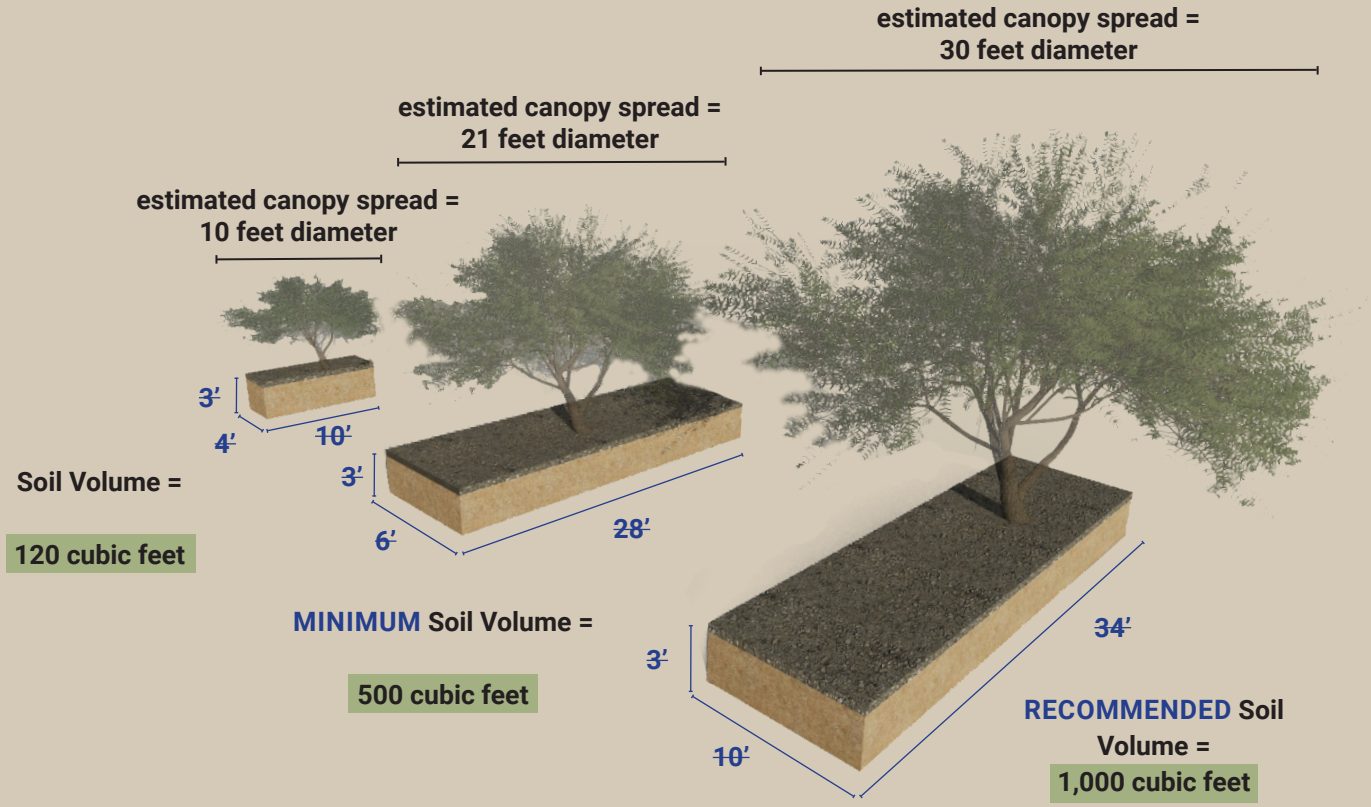


Figure 1-6. Diagram illustrating the relationship between soil volume and canopy potential.

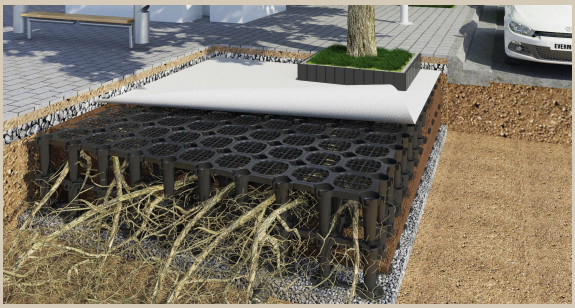
TR 7 Provide adequate soil volume in paved or compacted areas to support TREE CANOPY AND root growth.

TR 7.1 Provide a minimum of 500 cubic feet (CF) with a recommended 1,000 CF of soil volume. SOIL VOLUME CALCULATIONS SHOULD GENERALLY ASSUME 3 FEET OF ROOTABLE SOIL DEPTH UNLESS OTHERWISE JUSTIFIED BY THE PLANTING SYSTEM. SEE FIGURE 1-6.

TR 7.2 ~~Soil cells~~SUSPENDED PAVEMENT may be utilized in hardscaped areas or areas where 1,000 CF of soil volume cannot be achieved.

TR 7.3 When planting trees near hardscapes, use structural soil or supported soil systems to allow roots to grow beneath pavements while preventing soil compaction.

TR 7.4 Incorporate permeable paving or larger planting pits to increase available soil volume.



SUSPENDED PAVEMENT: SOIL CELLS

In hardscaped areas, soil cells provide uncompacted, nutrient-rich soil to support healthy tree root growth. These modular systems stabilize pavement while allowing roots to expand. Studies show trees in soil cells grow larger and healthier than those in compacted soils (EPA).

Figure 1-7. Description of soil cells.

TR 8 Prepare COMPACTED soils WHEN NECESSARY to ENSURE ~~improve structure, water infiltration, and nutrient availability, creating the foundation for~~ healthy tree establishment.

TR 8.1 Amend compacted soils with organic matter or mulch to improve water retention and nutrient availability (around rootball only and not below to avoid sinking as the organics break down). UTILIZE SUITABLE NATIVE SOIL WHERE FEASIBLE.

TR 8.2 Use techniques like deep tilling, air spade, or soil fracturing to break up compacted layers and increase infiltration.

TR 8.3 Design passive water harvesting systems (e.g., bioswales, rain gardens) to integrate water flow into planting areas, reducing water stress and enhancing soil health (see Water Harvesting Guidelines, pages 59 - 75).

TREE DIVERSITY

~~Apply the 30/20/10 Rule to~~ *Promote biodiversity~~,~~ TO support healthier ecosystems~~,~~ and enhance visual variety.*

TR 9 **Prevent monocultures (plantings dominated by a single species or family) by ~~ensuring~~ PROVIDING a balanced mix of ~~plant~~ TREE varieties ~~according to the 30/20/10 Rule~~.**

TR 9.1 FOR ROADWAY, CIVIC, AND LARGE-SCALE PRIVATE DEVELOPMENTS THAT MAY AFFECT OR ALTER THE CONTEXT AREA THROUGH LANDSCAPE DESIGN, CONSIDER APPLYING THE 30/20/10 RULE, WHERE

~~TR 9.1~~ no more than 30% of plants in a landscape PLAN ~~should~~ belong to the same family~~.~~,

~~TR 9.2~~ no more than 20% ~~of the plants should~~ belong to the same genus~~.~~, AND

~~TR 9.3~~ no more than 10% ~~of the plants should~~ belong to the same species.

Tree Diversity Benefits include:

- **Pest and Disease Resilience:** Diverse plantings reduce the risk of a single pest or disease wiping out large portions of the landscape.
- **Adaptability to Environmental Changes:** Mixed plantings are more likely to thrive under changing environmental conditions.
- **Ecosystem Support:** Biodiversity supports a wider range of pollinators, birds, and other wildlife, enhancing ecological health.
- **Aesthetic Appeal:** Varied plantings create more visually dynamic landscapes with seasonal interest, textures, and colors.

WHAT ARE FAMILY, GENUS & SPECIES?

Plants are classified by their family, genus and species, which group them based on shared characteristics.

Family

A group of plants that share broad characteristics about leaf shape, flower type, etc.
(All Mesquite are in the Fabaceae family)

Genus

Closely related trees within a family that share specific similarities, like growth habit or bark type
(Mesquite trees fall under the Genus 'Prosopis')

Species

The most specific level, referring to one exact type of tree
(Honey Mesquite species is '*glandulosa*')

Fabaceae Prosopis glandulosa **Example - Honey Mesquite**

Figure 1-8. Explanation of family, genus and species classifications.

TREE SELECTION

Choose site-appropriate, desert-adaptive trees that support both project objectives and shade and water conservation goals.

TR 10 Tree selection should support shade and water conservation goals.

TR 10.1 Projects should utilize tree species included in the Tree Guides (pages 38 - 47); when alternatives are proposed, use ADWR's Low Water Use and Drought Tolerant Plant List to support water-efficient selection and confirm equivalent canopy potential.

TR 10.2 Trees should be selected based on site-specific conditions and species attributes.

TR 10.3 In areas with special operational constraints (for example, the Scottsdale Airpark), select tree species compatible with the setting and coordinate with the appropriate stakeholders or City departments.

TR 10.4 In areas with sustained pedestrian activity (for example, schools, playgrounds, and community facilities), tree selection should consider pollen and allergen potential.

Choose site-appropriate, desert-adaptive trees.

SITE-SPECIFIC TREE LISTS

These lists recommend tree species based on location; however, final tree selection should account for site-specific environmental conditions and constraints. The lists are intended as guidance, and no guarantees are implied regarding performance at any individual site.

Near Building

- Anacacho Orchid
- Texas Mountain Laurel
- Palo Blanco
- Mulga
- **Desert Willow** ☀
- Yellow Bird of Paradise
- Fruitless Olive
- **Palo Verde** ☀
- **Ironwood** ☀
- Texas Ebony
- Sweet Acacia
- Chinese Elm
- Ghost Gum

Parking lots

- **Mesquite** ☀
- Mulga
- Yellow Bird of Paradise
- Texas Ebony
- Chinese Pistache
- Fruitless Olive
- **Desert Willow** ☀
- Live Oak
- **Palo Verde** (Edge) ☀
- Palo Blanco

Street - Back of Curb

- Mulga
- Chinese Pistache
- **Desert Willow** ☀
- Palo Blanco
- Ghost Gum

Street - Back of Sidewalk

- **Desert Willow** ☀
- **Palo Verde** ☀
- **Mesquite** ☀
- Yellow Bird of Paradise

Street - Median (6'-12' Wide)

- Mulga
- **Desert Willow** ☀
- Cascalote
- Date Palm

Street - Median (12'-20' Wide)

- Date Palm
- Fruitless Olive
- Willow Acacia
- Cascalote
- Mulga
- Yellow Bird of Paradise
- **Desert Willow** ☀
- Chaste Tree
- Featherbush
- Texas Mountain Laurel
- Mastic Tree
- Anacacho Orchid

Path/Sidewalks

- Chinese Pistache
- Mulga
- **Desert Willow** ☀
- Ghost Gum
- Shoestring Acacia
- Willow Acacia
- Chinese Elm
- **Mesquite** ☀
- Sweet Acacia

☀ **Appropriate for Environmentally Sensitive Lands (ESL)**

TREE GUIDES

Tree Guides feature recommended species and are intended to be used in conjunction with the subsequent design scenarios to assist in selecting the right tree species for a project.

- **Tree Name (Botanical and Common):** Identifies the species by both common and scientific names for accurate selection.
- **Size & Growth:** Indicates the mature height and width (h x w) and growth rate (Slow, Moderate, Fast).
- **Shade Type:** Defines the kind of shade the tree provides (High, Medium, or Dappled).
- **Water Needs:** Helps in selecting trees based on irrigation requirements (Low, Lower, Lowest).
- **Litter:** Assesses the level of maintenance required for fallen debris (Low, Medium, High).
- **Pool-friendly (Root Damage Potential):** Highlights the likelihood of roots causing issues with pools, sidewalks, utilities, or nearby structures.

Photo of tree

Appropriate for Environmentally Sensitive Lands (ESL)

Scientific name

YELLOW BIRD OF PARADISE

Caesalpinia mexicana-GILLIESII

Common name

Water usage

Ⓑ	Size(h x w)	10’ x 10’
	Growth Rate	fast
	Shade Type	medium
	Deciduous	no, evergreen
	Flower	yes, summer
	Fruit	no
	Water	lower
	Litter	medium
	Thorns	no
	Poisonous	no
	Pool-friendly	yes
Ⓒ	Distance Apart	8’ O.C.
Ⓐ	Min Sidewalk Dist.	4’
Ⓐ	Min Street Dist.	8’
Ⓓ	Min Building Dist.	4’
	Parking Lot	no
	Allergenic	non-allergenic

Low

Lower

Lowest

Letters ~~here~~ correspond ~~with letters~~ TO CALLOUTS in Design Scenarios (PAGES 89-98)

Color corresponds to tree size

Small trees

Medium trees

Large trees

Figure 1-9. Explanation of Tree Guide elements.

Small Trees

- Small trees grow up to 25’ tall, ideal for areas with size limits or close to buildings and infrastructure.
- Well suited to residential yards, patios, courtyards, driveways, walkways, neighborhood streets, and areas near utility lines.
- Provide filtered shade, color, and habitat without overpowering smaller spaces or creating excessive debris.

MULGA
Acacia aneura

Ⓑ	Size(h x w)	20’ x 15’
	Growth Rate	moderate
	Shade Type	dappled
	Deciduous	no, evergreen
	Flower	subtle
	Fruit	no
	Water	lower
	Litter	low
	Thorns	no
	Poisonous	no
	Pool-friendly	yes
Ⓒ	Distance Apart	12’ O.C.
Ⓐ	Min Sidewalk Dist.	5’
Ⓐ	Min Street Dist.	5’
Ⓓ	Min Building Dist.	5’
	Parking Lot	yes
	Allergen	non-allergenic

ANACACHO ORCHID
Bauhinia lunarioides

Ⓑ	Size(h x w)	10’ x 10’
	Growth Rate	moderate
	Shade Type	dappled
	Deciduous	yes, semi-evergreen
	Flower	yes, spring/summer
	Fruit	no
	Water	lower
	Litter	low
	Thorns	no
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	6’ O.C.
Ⓐ	Min Sidewalk Dist.	6’
Ⓐ	Min Street Dist.	6’
Ⓓ	Min Building Dist.	5’
	Parking Lot	no
	Allergen	non-allergenic

TEXAS MOUNTAIN LAUREL
Dermatophyllum secundiflorum

Ⓑ	Size(h x w)	15’ x 15’
	Growth Rate	slow
	Shade Type	dappled
	Deciduous	no, evergreen
	Flower	yes, spring
	Fruit	yes
	Water	lower
	Litter	medium
	Thorns	no
	Poisonous	yes, seedpods
	Pool-friendly	yes
Ⓒ	Distance Apart	8’ O.C.
Ⓐ	Min Sidewalk Dist.	4’
Ⓐ	Min Street Dist.	6’
Ⓓ	Min Building Dist.	6’
	Parking Lot	no
	Allergen	non-allergenic

YELLOW BIRD OF PARADISE

Caesalpinia ~~mexicana~~ GILLIESII

Ⓑ	Size(h x w)	10’ x 10’
	Growth Rate	fast
	Shade Type	medium
	Deciduous	no, evergreen
	Flower	yes, summer
	Fruit	no
	Water	lower
	Litter	medium
	Thorns	no
	Poisonous	no
	Pool-friendly	yes
Ⓒ	Distance Apart	8’ O.C.
Ⓐ	Min Sidewalk Dist.	4’
Ⓐ	Min Street Dist.	8’
Ⓓ	Min Building Dist.	4’
	Parking Lot	no
	Allergen	non-allergenic

DESERT WILLOW*

*Seedless Varieties

Chilopsis linearis

Ⓑ	Size(h x w)	25’ x 20’
	Growth Rate	fast
	Shade Type	dappled
	Deciduous	yes
	Flower	yes, spring/fall
	Fruit	no
	Water	lowest
	Litter	medium
	Thorns	no
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	15’ O.C.
Ⓐ	Min Sidewalk Dist.	6’
Ⓐ	Min Street Dist.	6’
Ⓓ	Min Building Dist.	10’
	Parking Lot	yes
	Allergen	non-allergenic

CASCALOTE

Caesalpinia cacalaco

Ⓑ	Size(h x w)	15’x15’
	Growth Rate	slow
	Shade Type	moderate
	Deciduous	yes, semi-evergreen
	Flower	yes, winter/spring
	Fruit	no
	Water	lower
	Litter	low
	Thorns	yes
	Poisonous	yes
	Pool-friendly	no
Ⓒ	Distance Apart	20’ O.C.
Ⓐ	Min Sidewalk Dist.	7’
Ⓐ	Min Street Dist.	5’
Ⓓ	Min Building Dist.	10’
	Parking Lot	yes
	Allergen	non-allergenic

FEATHER BUSH

Lysiloma watsonii

Ⓑ	Size(h x w)	15’ x 15’
	Growth Rate	moderate
	Shade Type	moderate
	Deciduous	no, evergreen
	Flower	yes, spring/summer
	Fruit	no
	Water	lower
	Litter	medium
	Thorns	no
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	15’ O.C.
Ⓐ	Min Sidewalk Dist.	6’
Ⓐ	Min Street Dist.	6’
Ⓓ	Min Building Dist.	10’
	Parking Lot	yes
	Allergen	non-allergenic

MASTIC
Pistacia lentiscus

Ⓑ	Size(h x w)	15’ x 20’
	Growth Rate	slow
	Shade Type	high
	Deciduous	no, evergreen
	Flower	yes, spring
	Fruit	no
	Water	lower
	Litter	low
	Thorns	no
	Poisonous	no
	Pool-friendly	yes
Ⓒ	Distance Apart	10’ O.C.
Ⓐ	Min Sidewalk Dist.	6’
Ⓐ	Min Street Dist.	6’
Ⓓ	Min Building Dist.	8’
	Parking Lot	yes
	Allergen	non-allergenic

CHASTE TREE
Vitex agnus-castus

Ⓑ	Size(h x w)	15’ x 15’
	Growth Rate	slow
	Shade Type	high
	Deciduous	yes
	Flower	yes, spring/summer
	Fruit	no
	Water	lower
	Litter	medium
	Thorns	yes
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	10 O.C.
Ⓐ	Min Sidewalk Dist.	6’
Ⓐ	Min Street Dist.	6’
Ⓓ	Min Building Dist.	5’
	Parking Lot	yes
	Allergen	non-allergenic

PALO BLANCO
Mariosousa willardiana

Ⓑ	Size(h x w)	20’ x 10’
	Growth Rate	slow
	Shade Type	dappled
	Deciduous	yes, semi-evergreen
	Flower	yes, spring
	Fruit	no
	Water	lowest
	Litter	medium
	Thorns	no
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	10’ O.C.
Ⓐ	Min Sidewalk Dist.	6’
Ⓐ	Min Street Dist.	6’
Ⓓ	Min Building Dist.	5’
	Parking Lot	yes
	Allergen	non-allergenic

Medium Trees

- Medium trees grow 25’ – 40’ tall and are highly versatile in streetscapes and neighborhoods.
- Ideal for sidewalks, medians, parking areas, and residential yards, offering shade for pedestrians, vehicles, and outdoor spaces.
- Can be planted near streets or buildings with careful attention to root space, canopy spread, and maintenance needs.

SWEET ACACIA

Acacia farnesiana

Ⓑ	Size(h x w)	30’ x 30’
	Growth Rate	moderate
	Shade Type	medium
	Deciduous	no, evergreen
	Flower	yes
	Fruit	no
	Water	lower
	Litter	high
	Thorns	yes
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	24’ O.C.
Ⓐ	Min Sidewalk Dist.	7’
Ⓐ	Min Street Dist.	5’
Ⓓ	Min Building Dist.	8’
	Parking Lot	yes
	Allergen	allergenic, seasonal

CHINESE PISTACHE

Pistacia chinensis

Ⓑ	Size(h x w)	30’ x 25’
	Growth Rate	moderate
	Shade Type	medium
	Deciduous	yes, semi-evergreen
	Flower	yes, fall color change
	Fruit	yes, female species
	Water	lower
	Litter	low
	Thorns	no
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	20’ O.C.
Ⓐ	Min Sidewalk Dist.	5’
Ⓐ	Min Street Dist.	5’
Ⓓ	Min Building Dist.	10’
	Parking Lot	yes
	Allergen	non-allergenic

FRUITLESS OLIVE

Olea europea ‘Wilsonii’

Ⓑ	Size(h x w)	25’ x 25’
	Growth Rate	slow
	Shade Type	medium
	Deciduous	no,evergreen
	Flower	yes, spring
	Fruit	no
	Water	lower
	Litter	low
	Thorns	no
	Poisonous	no
	Pool-friendly	yes
Ⓒ	Distance Apart	20’ O.C.
Ⓐ	Min Sidewalk Dist.	6’
Ⓐ	Min Street Dist.	8’
Ⓓ	Min Building Dist.	10’
	Parking Lot	yes
	Allergen	allergenic, low pollen

IRONWOOD

Olneya tesota

Ⓑ	Size(h x w)	25’ x 25’
	Growth Rate	slow
	Shade Type	medium
	Deciduous	no, evergreen
	Flower	yes, spring
	Fruit	no
	Water	lowest
	Litter	low
	Thorns	yes
	Poisonous	no
	Pool-friendly	yes
Ⓒ	Distance Apart	20’ O.C.
Ⓐ	Min Sidewalk Dist.	7’
Ⓐ	Min Street Dist.	5’
Ⓓ	Min Building Dist.	10’
	Parking Lot	yes
	Allergen	non-allergenic

TEXAS EBONY

Ebenopsis ebano

Ⓑ	Size(h x w)	20’ x 15’
	Growth Rate	slow
	Shade Type	high
	Deciduous	no, evergreen
	Flower	yes, spring/summer
	Fruit	no
	Water	lower
	Litter	medium
	Thorns	yes
	Poisonous	no
	Pool-friendly	yes
Ⓒ	Distance Apart	10 O.C.
Ⓐ	Min Sidewalk Dist.	6’
Ⓐ	Min Street Dist.	6’
Ⓓ	Min Building Dist.	8’
	Parking Lot	yes
	Allergen	non-allergenic

COOLIBAH

Eucalyptus microtheca

Ⓑ	Size(h x w)	35’ x 25’
	Growth Rate	fast
	Shade Type	high
	Deciduous	no, evergreen
	Flower	yes, spring/summer
	Fruit	no
	Water	lower
	Litter	moderate
	Thorns	no
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	24’ O.C.
Ⓐ	Min Sidewalk Dist.	5’
Ⓐ	Min Street Dist.	5’
Ⓓ	Min Building Dist.	10’
	Parking Lot	yes
	Allergen	non-allergenic

DATE PALM

Phoenix dactylifera

Ⓑ	Size(h x w)	80’ x 20’
	Growth Rate	slow
	Shade Type	dappled
	Deciduous	no, evergreen
	Flower	no
	Fruit	yes
	Water	low
	Litter	medium
	Thorns	yes, base of frond
	Poisonous	no
	Pool-friendly	yes
Ⓒ	Distance Apart	16’ O.C.
Ⓐ	Min Sidewalk Dist.	5’
Ⓐ	Min Street Dist.	8’
Ⓓ	Min Building Dist.	5’
	Parking Lot	no
	Allergen	non-allergenic

PALO VERDE

Parkinsonia spp.

Ⓑ	Size(h x w)	25’ x 25’
	Growth Rate	moderate
	Shade Type	dappled
	Deciduous	yes
	Flower	yes, spring
	Fruit	no
	Water	lowest
	Litter	high
	Thorns	yes
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	20’ O.C.
Ⓐ	Min Sidewalk Dist.	5’
Ⓐ	Min Street Dist.	6’
Ⓓ	Min Building Dist.	8’
	Parking Lot	yes
	Allergen	non-allergenic

MESQUITE TREES

Neltuma Spp. [formerly Prosospis spp.]

Ⓑ	Size(h x w)	30’ x 30’
	Growth Rate	moderate
	Shade Type	medium
	Deciduous	yes, semi-evergreen
	Flower	subtle
	Fruit	no
	Water	lowest
	Litter	medium
	Thorns	no
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	24’ O.C.
Ⓐ	Min Sidewalk Dist.	5’
Ⓐ	Min Street Dist.	6’
Ⓓ	Min Building Dist.	10’
	Parking Lot	yes
	Allergen	allergenic, seasonal

MESQUITE (SEEDLESS)

Neltuma seedless hybrid [formerly Prosospis spp.]

Ⓑ	Size(h x w)	30’ x 30’
	Growth Rate	moderate
	Shade Type	medium
	Deciduous	yes, semi-evergreen
	Flower	subtle
	Fruit	no
	Water	lowest
	Litter	medium
	Thorns	no
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	24’ O.C.
Ⓐ	Min Sidewalk Dist.	5’
Ⓐ	Min Street Dist.	6’
Ⓓ	Min Building Dist.	10’
	Parking Lot	yes
	Allergen	allergenic, seasonal

Large Trees

- Large trees grow over 40’ tall and play a key role in expanding citywide canopy and cooling.
- Best for large residential lots, parks, open spaces, and wide rights-of-way, where they can provide deep shade, reduce heat, and support biodiversity.
- Must be carefully sited to avoid conflicts with buildings, sidewalks, and overhead or underground utilities.

LIVE OAK

Quercus virginiana

Ⓑ	Size(h x w)	40’ x 50’
	Growth Rate	slow
	Shade Type	high
	Deciduous	yes, semi-evergreen
	Flower	no
	Fruit	yes, nut
	Water	lower
	Litter	low
	Thorns	no
	Poisonous	no
	Pool-friendly	yes
Ⓒ	Distance Apart	24’ O.C.
Ⓐ	Min Sidewalk Dist.	5’
Ⓐ	Min Street Dist.	5’
Ⓓ	Min Building Dist.	10’
	Parking Lot	yes
	Allergen	allergenic, seasonal

CHINESE ELM

Ulmus parvifolia

Ⓑ	Size(h x w)	45’ x 45’
	Growth Rate	fast
	Shade Type	medium
	Deciduous	yes, semi-evergreen
	Flower	no
	Fruit	yes, poison
	Water	low
	Litter	medium
	Thorns	no
	Poisonous	yes, berries
	Pool-friendly	no
Ⓒ	Distance Apart	24’ O.C.
Ⓐ	Min Sidewalk Dist.	5’
Ⓐ	Min Street Dist.	5’
Ⓓ	Min Building Dist.	10’
	Parking Lot	yes
	Allergen	non-allergenic

GHOST GUM

Corymbia aparrerinja [formerly Eucalyptus papuana]

Ⓑ	Size(hxw	40’ x 25’
	Growth Rate	fast
	Shade Type	medium
	Deciduous	no, evergreen
	Flower	no
	Fruit	no
	Water	lower
	Litter	medium
	Thorns	no
	Poisonous	semi
	Pool-friendly	no
Ⓒ	Distance Apart	20’ O.C.
Ⓐ	Min Sidewalk Dist.	4’
Ⓐ	Min Street Dist.	4’
Ⓓ	Min Building Dist.	4’
	Parking Lot	yes
	Allergen	non-allergenic

SHOE STRING ACACIA

Acacia stenophylla

Ⓑ	Size(h x w)	40′ x 30′
	Growth Rate	fast
	Shade Type	high
	Deciduous	no, evergreen
	Flower	yes, fall/
	Fruit	winter
	Water	no
	Litter	low
	Thorns	no
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	24′ O.C.
Ⓐ	Min Sidewalk Dist.	5′
Ⓐ	Min Street Dist.	5′
Ⓓ	Min Building Dist.	8′
	Parking Lot	yes
	Allergen	non-allergenic

WILLOW ACACIA

Acacia salicina

Ⓑ	Size(h x w)	40′ x 30′
	Growth Rate	fast
	Shade Type	medium
	Deciduous	no, evergreen
	Flower	yes
	Fruit	no
	Water	lower
	Litter	high
	Thorns	no
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	24′ O.C.
Ⓐ	Min Sidewalk Dist.	5′
Ⓐ	Min Street Dist.	5′
Ⓓ	Min Building Dist.	10′
	Parking Lot	yes
	Allergen	non-allergenic

TIPU

Tipuana tipu

Ⓑ	Size(h x w)	35′ x 50′
	Growth Rate	fast
	Shade Type	high
	Deciduous	yes, semi-evergreen
	Flower	yes, summer
	Fruit	yes
	Water	low
	Litter	medium
	Thorns	no
	Poisonous	no
	Pool-friendly	no
Ⓒ	Distance Apart	30′ O.C.
Ⓐ	Min Sidewalk Dist.	6′
Ⓐ	Min Street Dist.	6′
Ⓓ	Min Building Dist.	15′
	Parking Lot	no
	Allergen	allergenic, seasonal

TREE STAKING

Stake trees properly to provide stability during early growth while the root system establishes.

TR 11 Implement proper staking techniques to support tree growth and health according to Maricopa Association of Governments (MAG) Uniform Standard Details for Public Works Construction.

TR 11.1 When planting, maintain the root flare above finished grade (soil level) to ensure the tree gets enough oxygen and has proper drainage.

TR 11.2 Remove nursery stakes promptly, unless otherwise specified, to prevent restriction of trunk growth and encourage natural movement.

TR 11.3 For small to medium-sized trees in moderate wind conditions, use two stakes placed on opposite sides of the tree (Figure 1-10. MAG Detail 601-1).

TR 11.4 For tall, heavy, or wind-sensitive trees, use three stakes evenly spaced around the tree (Figure 1-10. MAG Detail 601-3).

TR 11.5 Position stakes outside the root ball to avoid root damage.

TR 11.6 Use soft, flexible tree ties to prevent girdling (when the tie cuts into the tree).

TR 11.7 Use stakes and guy lines (typically cabLe, cord, or rope) to provide stability and support while allowing the tree to sway naturally in the wind.

TR 11.8 Remove stakes as soon as the tree can stand upright and withstand normal wind conditions.

Planting Depth to Maintain Root Flare

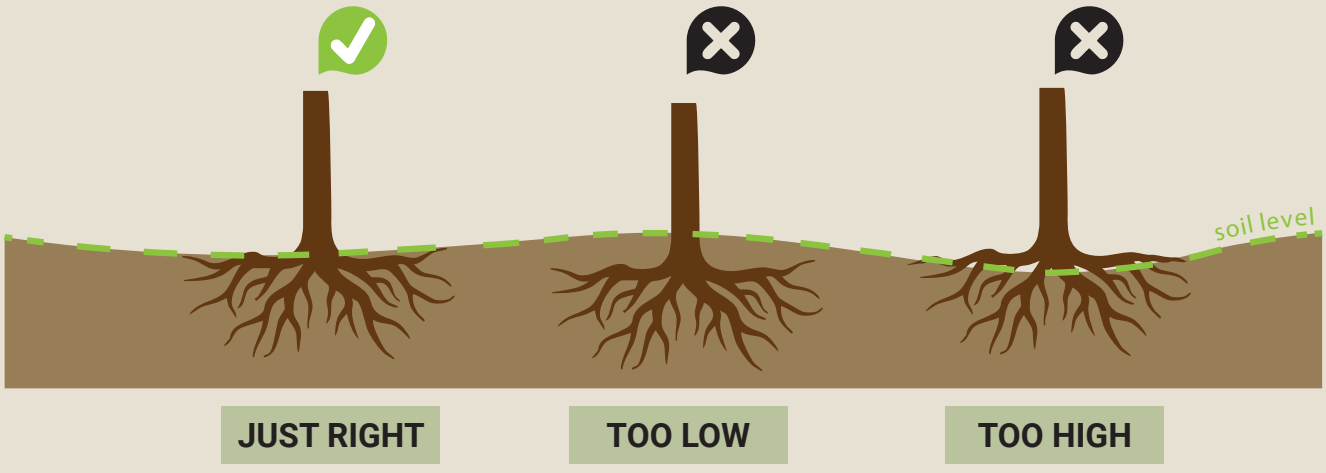


Figure 1-10. Depictions of possible root flare scenarios.

Figure 1-10. Double Stake Tree (MAG Detail 601-1)

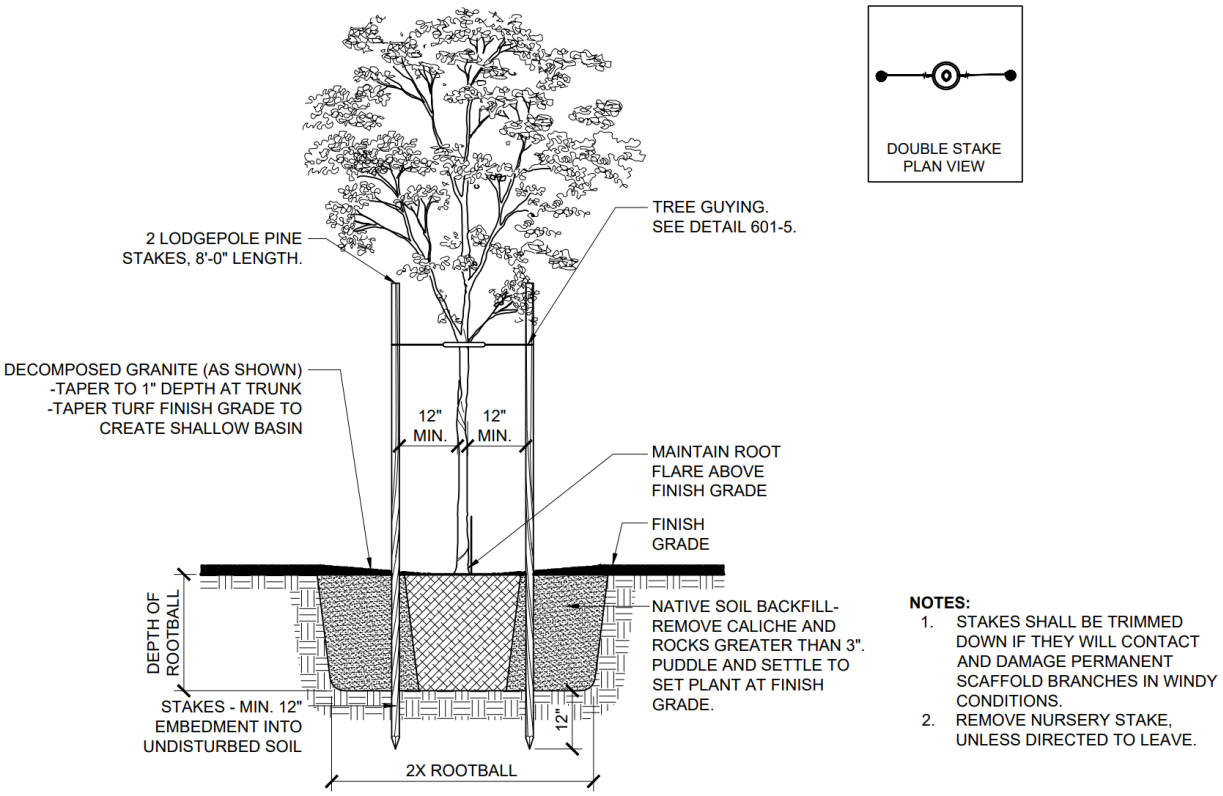


Figure 1-11. Triple Stake Tree (MAG Detail 601-3)

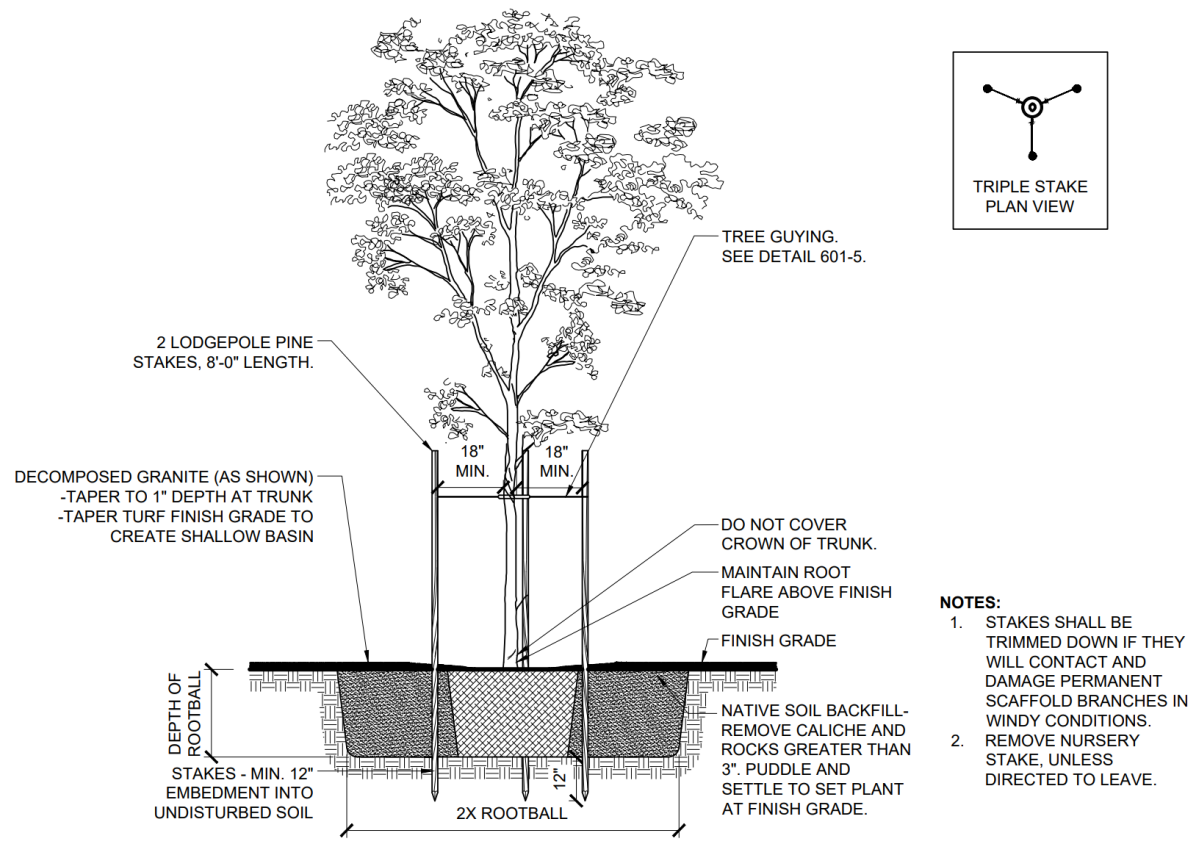
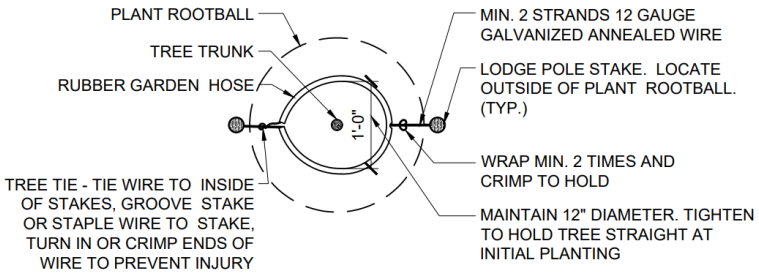
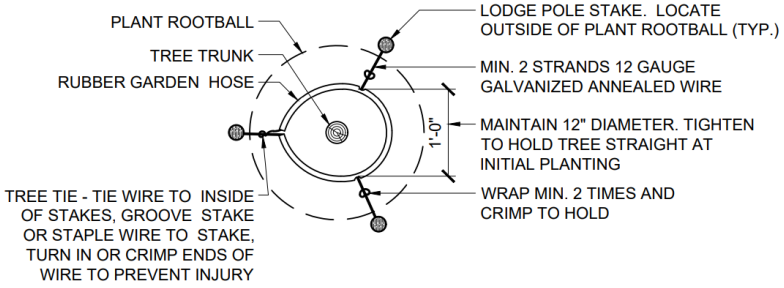


Figure 1-11. Tree Staking and Guying for Single Trunks (MAG Detail 601-5)



TREE STAKING PLAN - DOUBLE



TREE STAKING PLAN - TRIPLE

Proper Staking Timeline

First 6-12 Months - Initial Stabilization:

- Use stakes to stabilize the tree until the root system is established.
- For most trees, 6-12 months is sufficient to provide the necessary support.

After 6 Months - Tree Health Check:

- Inspect the stakes and ties regularly to ensure they are not causing bark damage or girdling the tree.
- Gently wiggle the tree. If it stands upright without excessive movement, the stakes may no longer be needed.

Up to 2 Years - Extended Staking:

- For trees in windy areas or with weak root systems, stakes may remain necessary for up to 2 years.
- Adjust ties as the tree grows to prevent girdling and ensure proper support.

EFFICIENT WATERING STRATEGIES

Apply watering strategies that match species needs, site conditions, and seasonal variability to optimize resources and support long-term tree health.

TR 12 Implement efficient irrigation practices to ensure trees receive adequate water without unnecessary waste.

TR 12.1 Account for species-specific water needs and soil types when planning irrigation.

TR 12.2 Use drip irrigation and deep root watering methods to deliver water directly to the root zone, minimize evaporation and reduce runoff.

TR 12.3 Position emitters or deep root watering devices at the drip line, the outer edge of the tree canopy where active roots are concentrated.

TR 12.4 Adjust emitter placement outward as trees mature to promote expanding root systems and healthier trees.

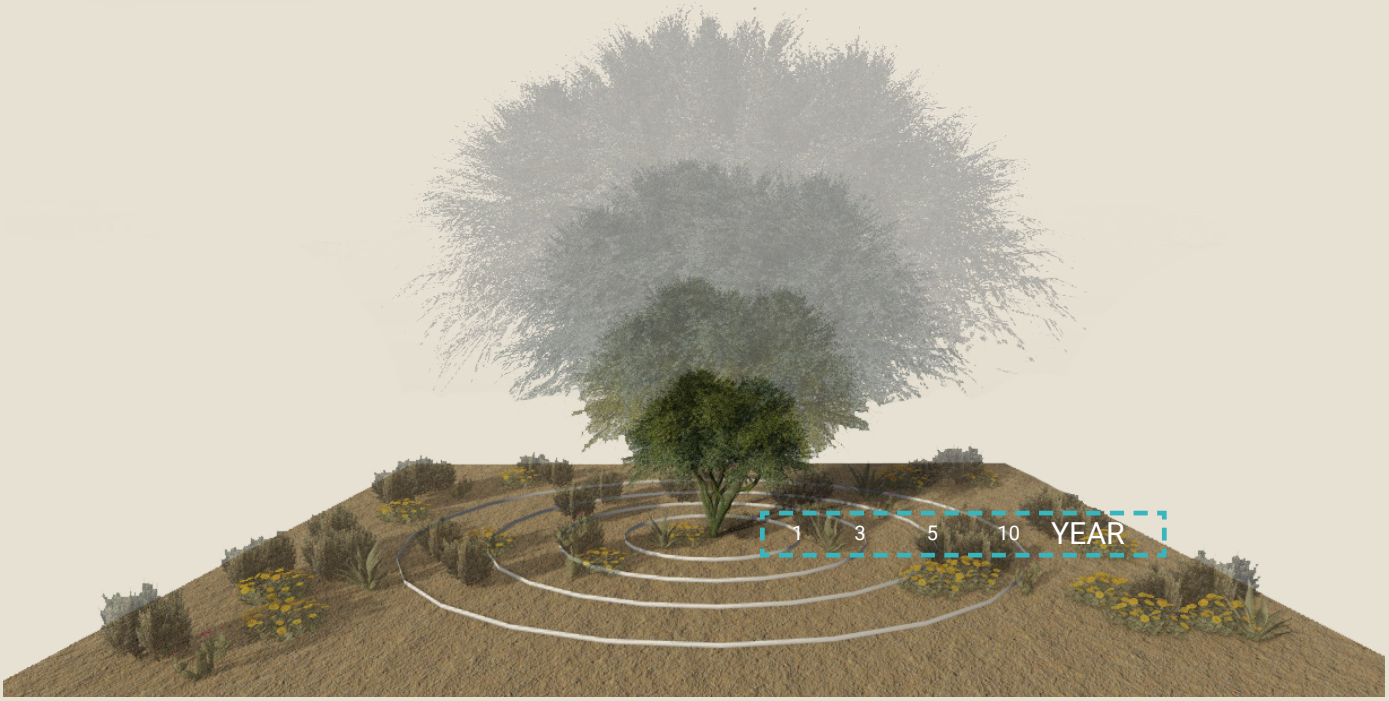


Figure 1-12. Diagram illustrating the placement of emitters over time as a tree matures (TR 11.4).

TR 13 Utilize smart irrigation controllers to automate watering schedules.

TR 13.1 Adjust watering frequency based on tree age.

TR 13.2 Adjust watering frequency based on weather and seasonal conditions.

Tree Irrigation Basics

YOUNG TREES

Young trees have small, shallow root systems and dry out quickly. They need more frequent, focused watering at the root zone to support establishment. The goal is to keep soil consistently moist—but not waterlogged—to promote strong root growth and canopy expansion.

MATURE TREES

Mature trees have larger, deeper root systems and can access moisture from a wider area. They typically need less frequent, deeper watering and can tolerate short dry periods. However, they may still need supplemental irrigation during extended heat or drought. Watering decisions for older trees should be based on soil moisture, seasonal climate, and species needs. Overwatering can compromise tree limbs.

Table 1-1. Recommended Irrigation Minimums

GROWTH STAGE ~~(YEARS)~~	TREE AGE (YEARS)	WATERING FREQUENCY (DAYS)
Establishment	1	Every 4-10 Days
Young Tree	2-3	Every 14-21 Days
Maturing Tree	3-5	Every 21-30 Days
Mature Tree	5+	Once Every 30-45 Days (or after significant dry periods)

Spring

- Begin deep watering as trees emerge from dormancy and start active growth.
- Monitor rainfall; supplemental irrigation may still be necessary if the weather is dry.
- Focus on moisture levels for specific species to encourage new root development.

Summer

- Increase watering frequency due to higher temperatures and evapotranspiration.
- Water deeply and early in the morning to reduce evaporation and avoid disease.
- Mulch under the tree canopy can help to retain soil moisture and regulate temperature.

Wet Summer

- Water only if there are prolonged dry periods and temperatures allow.
- Focus on maintaining minimal soil moisture to prevent root rot and other issues in many species.
- Avoid fertilizing & watering as it can overly accelerate weak growth; just ensure roots aren't drying out entirely.

Fall

- Fall can be hot here in the desert with continuing high tempatures from summer. Continue your summer watering as needed.
- Gradually reduce watering as temperatures cool, but don't stop too early.
- Deep watering in early fall helps trees store moisture for dormancy.

Winter

- Lessen your watering during wet winters & adjust for dry and warm weeks or extended spells.
- Avoid watering when soil is saturated.
- Protect young or newly planted trees with mulch to insulate roots and potential frosts.

TREE PRUNING & MAINTENANCE

Conduct pruning according to best practices to maintain tree health and reduce hazards.

This section outlines maintenance standards to support the long-term viability of Scottsdale's tree canopy. The pruning guidelines align with the American National Standards Institute (ANSI) A300 Pruning Standards and the International Society of Arboriculture (ISA) Best Management Practices: Tree Pruning. While these serve as a baseline, Scottsdale's guidelines are further optimized for the unique conditions of the Southwest, emphasizing shade optimization, tree longevity and resilience to the region's climate.

Benefits of Pruning

- **Health:** Removing diseased or insect-infested branches, thinning the crown to improve airflow, and eliminating crossing or rubbing branches all promote stronger and healthier trees.
- **Safety:** Pruning prevents potential hazards by removing weak or damaged branches that could fall and by maintaining clearance for streets, sidewalks, and signage.
- **Aesthetics:** Strategic pruning enhances natural form and character, contributing to Scottsdale's distinctive landscape identity.

Appropriate pruning maintains tree health and supports sense of place.

TR 14 Pruning and related maintenance decisions should be conducted in a manner that preserves tree health, protects public safety, and maintains functional clearance and natural form.

TR 14.1 ISA-Certified Arborist supervision is recommended for pruning on City-owned property.

TR 14.2 Maintain required clearances, including 8’ over sidewalks and 14’ over vehicular areas.

TR 14.3 Remove dead, diseased, broken, crossing, weakly attached, or hazardous branches to maintain safety and tree vitality.

Pruning methods should support tree health.

TR 14.4 Avoid excessive summer pruning to prevent sunburn on newly exposed areas.

TR 14.5 Do not apply pruning sealants, which can trap bacteria and compromise health.

TR 14.6 Evaluate volunteer trees early and retain those that are healthy and appropriately located, or remove them when they are incompatible with the setting or likely to create conflicts with sightlines, pedestrian facilities, infrastructure, or drainage.

TR 14.7 Avoid the relocation or removal of mature trees except when the tree is dead, failing, or unsafe and cannot be mitigated, or when improvements cannot reasonably be designed around it.

TR 14.8 In Environmentally Sensitive Lands, maintain and prune trees in a manner that supports fire defensible space.

TR 15 Pruning should align with species characteristics, growth habits, and appropriate seasonal timing to support long-term structural integrity.

TR 15.1 Prune deciduous trees during winter dormancy to support vigorous spring growth.

TR 15.2 Prune desert trees selectively and periodically to maintain a natural form.

TR 15.3 Avoid practices that create unnatural or structurally weak forms.

TR 15.4 Prioritize structural development in young trees during the first 5–10 years after planting:

- TR 15.4.1 Retain lower branches for the first three years to promote trunk strength and caliper growth.
- TR 15.4.2 Encourage strong leader development (one leader for single-trunk trees; three to four leaders for multi-trunk specimens).
- TR 15.4.3 Remove branches with narrow or excessively wide attachment angles.
- TR 15.4.4 Reduce branch length only when necessary for clearance or to limit storm damage.

TR 16 Standardized pruning methods should be applied appropriately to address specific objectives while preserving tree structural stability and natural appearance.

TR 16.1 Crown Cleaning: Remove dead, diseased, broken, weak, or low-vigor branches; remove suckers and water sprouts as appropriate.

TR 16.2 Crown Raising: Remove lower branches to achieve required clearance for pedestrians, vehicles, structures, or signage; evaluate species tolerance and consider tree age.

TR 16.3 Crown Reduction: Reduce height and/or spread where trees conflict with structures or utilities.

TR 16.4 Crown Thinning: Selectively remove live branches to reduce crown density while maintaining a balanced, natural appearance.

TR 16.5 Weight Reduction: Reduce end-weight on long or heavy limbs to minimize the risk of limb or trunk failure.

TR 16.6 Crown Restoration: Restore form and structural integrity in trees damaged by topping, storms, or vandalism; multiple sessions may be required.

TR 16.7 Palm Pruning:

- TR 16.7.1 Trim annually between May 15 and June 15, prior to flowering.
- TR 16.7.2 Do not remove green fronds above the horizontal trunk line
- TR 16.7.3 Remove hazardous fronds, fruit, or loose petioles as needed.
- TR 16.7.4 Avoid cutting all fronds below a 45-degree angle and avoid creating carrot or pencil-pointed forms.

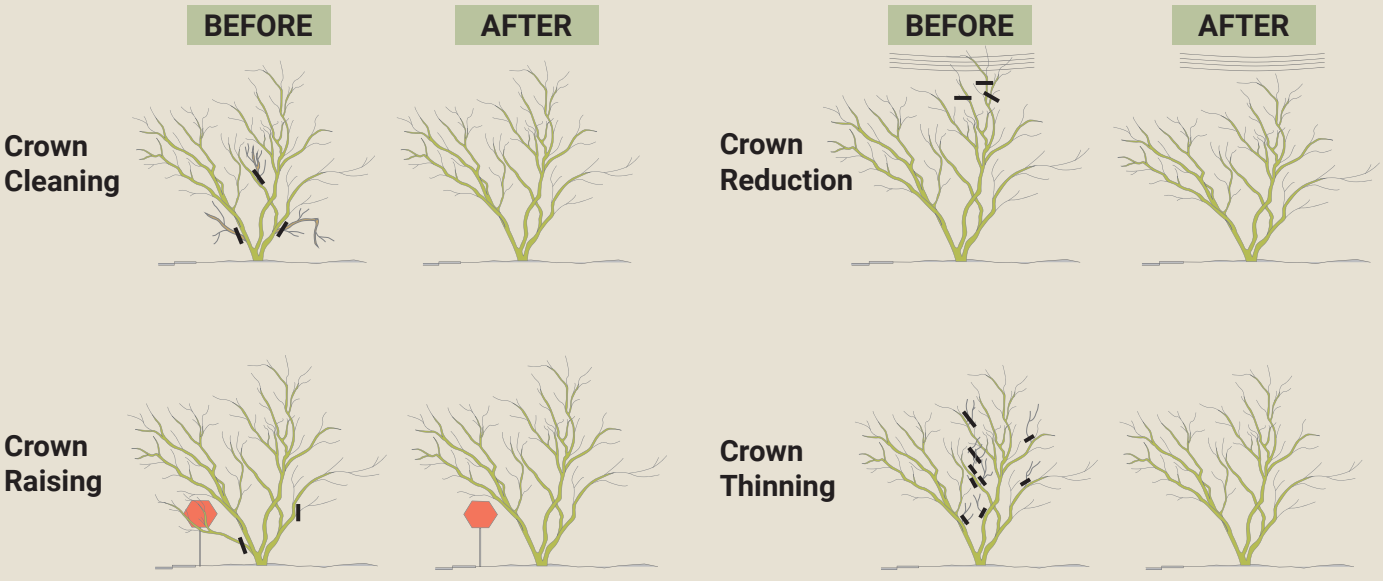


Figure 1-13. Graphic depicting before and after conditions for standardized pruning methods.

PRUNING BEST PRACTICES

Pruning Cuts

Proper pruning starts with using the right tools and making clean cuts that protect the tree.

- Use clean, sharp tools sized appropriately for each cut; disinfect between trees to reduce spread of disease.
- Use bypass hand pruners for cuts up to ¾ inch, loppers for branches up to 2 inches, and hand saws for branches up to 4 inches; use pruning saws for larger branches, cutting on the pull stroke.

Pruning should follow ANSI A300 and ANSI Z133.1 standards and ISA Best Management Practices: Tree Pruning, under the supervision of an ISA Certified Arborist.

THE 3 STEP PRUNING CUT

1. Cut one-third of the way through the branch on the underside.
2. Go 2-4 inches beyond the undercut to remove the branch.
3. Make the final cut just outside the branch bark ridge and trunk collar.

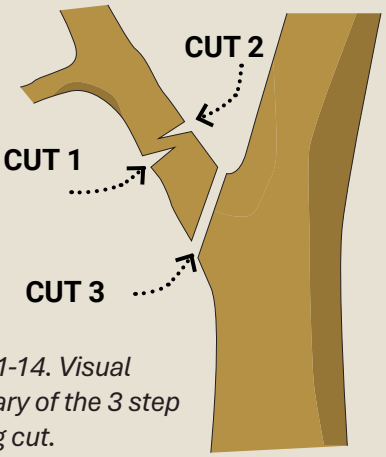


Figure 1-14. Visual summary of the 3 step pruning cut.

Harmful Practices to Avoid

Certain pruning methods cause long-term damage and should not be used on trees in Scottsdale.

- Improper cuts can cause bark ripping, decay, and long-term structural problems.
- Avoid tools or techniques that crush bark or damage the tree.
- Avoid the use of climbing spikes or spurs.
- Avoid flush cuts that remove the branch collar and injure stem tissue.
- Avoid stub cuts that leave long stubs, delay wound closure, and invite pests and disease.
- Avoid anvil-type pruners, which can cause tree damage rather than making clean cuts.
- Do not use topping (removing large upright branches between nodes) or tipping (cutting lateral branches between nodes to reduce length or crown width); these practices create weak sprouts and can kill branches back to the next lateral.
- Avoid poodling, balling, squaring, and lions tailing (removing most interior branches and leaving foliage only at the tips).
- Avoid removing more than about 25% of the live canopy during any single pruning.

WATER HARVESTING

Water conservation and efficiency are critical components to managing Scottsdale's water supply. Long-term drought and limited water resources are an ongoing challenge in our desert community. To balance economic growth with water needs, prioritizing landscape practices such as selecting low-water-use trees and plant material will help ensure long-term viability and a livable desert community. In that context, water harvesting is a foundational component of Scottsdale's approach to shade, comfort, and long-term landscape resilience. By treating stormwater as a resource, water harvesting expands the city's ability to sustain healthy trees, support vegetation, and cool the built environment. When paired with strategic planting and shade infrastructure, these systems strengthen Scottsdale's urban canopy and improve livability in both public and private spaces.

This section provides technical guidance and design direction for incorporating water harvesting and Green Stormwater Infrastructure (GSI) across Scottsdale. Passive systems—such as bioswales, rain gardens, curb cuts, and permeable surfaces—slow, capture, and infiltrate rainfall directly into the landscape, supporting root growth and reducing runoff. Active systems, including cisterns, collect excess stormwater for targeted reuse, reducing demand on potable water for irrigation in the process.

The Water Harvesting Guidelines establish a unified framework for designing, locating, and maintaining these systems so they function effectively in Scottsdale's desert conditions. The guidelines are intended to inform project planning and review, ensuring that new and retrofitted landscapes align with the city's broader shade and water capture goals.

Well-designed water harvesting systems strengthen the health and longevity of trees, expand rootable soil volume, and enhance the cooling performance of landscape and shade features. By integrating stormwater management with site planning, these guidelines support a greener, cooler, and more resilient Scottsdale.

Design and Implementation Framework

The Water Harvesting Guidelines outline expectations for stormwater capture, infiltration performance, and integration with site design, while allowing flexibility for context-sensitive and innovative solutions. Rather than prescribing a single approach, these guidelines establish a shared understanding of how effective water harvesting systems function across Scottsdale's varied urban environments.

Water harvesting works in tandem with the Trees and Shade Structure Guidelines, together forming the technical foundation of the Shade & Tree Plan. Passive systems provide natural infiltration that supports tree health and reduces runoff, while active systems offer opportunities to store and reuse water during dry periods. An integrated site design ensures stormwater reaches landscape areas where it can provide the greatest ecological and cooling benefits.

The Water Harvesting Guidelines provide detailed direction organized under three primary categories:

Location & Application ensures that water harvesting systems are integrated into site planning so runoff is routed into GSI features that maximize infiltration, support shade trees and pedestrian comfort, and reduce reliance on potable water for irrigation.

Stormwater Context & Performance sets expectations for capturing and managing runoff, matching designs to site drainage and infiltration conditions, and selecting from appropriate GSI practices to protect water quality and nearby infrastructure.

Maintenance & Longevity ensures that water-harvesting systems can be inspected, maintained, and adjusted over time so they continue to support shade and long-term performance.

Curb cut and bioswale.

Runoff vs. Infiltration

Low runoff, high infiltration

Permeable surfaces and GSI features slow stormwater down, spread it out, and soak it into the soil. This keeps water on-site to support trees, improve shade performance, and reduce demand on storm drains and potable water for irrigation.

High runoff, little to no infiltration

Large impervious areas shed most rainfall as fast-moving runoff. Water is quickly routed to pipes and outfalls instead of infiltrating, which limits soil moisture for trees, increases erosion potential, and misses an opportunity to cool the site.

Projects should aim to convert as much area as possible from high-runoff to high-infiltration conditions.

Gray Water

Scottsdale does not actively promote gray water systems, as wastewater from homes and businesses is already collected, treated, and reused through the City's reclamation program. Reclaimed water is used for landscape irrigation and regional partnerships, with additional supplies stored underground for future needs. While gray water can provide an additional on-site water source for trees, its citywide impact is limited given Scottsdale's existing water recycling and reuse efforts.

LOCATION & APPLICATION

Locate and configure water-harvesting systems so stormwater supports shade trees, planted areas, and comfortable public spaces.

WH 1 Integrate GSI into site planning.

WH 1.1 Route runoff from roofs, plazas, parking, and roadways to basins, bioswales, rain gardens, tree trenches, or similar GSI features before underground piping.

WH 1.2 Align GSI locations with desired shade areas, pedestrian routes, and gathering spaces.

Curb cut and mini check dam.

WH 2 Direct stormwater to support tree health and pedestrian comfort.

WH 2.1 Locate basins and GSI features so that tree root zones serving public spaces and pedestrian areas receive harvested water.

WH 2.2 Provide defined overflow paths that protect buildings, walkways, and adjacent properties from erosion and ponding.

WH 2.3 Use pretreatment (e.g., sediment traps or rock mulch) at curb cuts and inlets to protect infiltration areas from sediment and debris.

WH 2.4 Select appropriate trees for inundation areas and side slopes.

WH 3 Match water-harvesting strategies to the surrounding land-use context.

WH 3.1 In commercial and mixed-use areas, direct roof and plaza runoff to bioretention swales, basins, rain gardens, and tree planters near entries and outdoor seating.

WH 3.2 In pedestrian environments, use linear bioswales, tree trenches, and rain gardens adjacent to walkways to provide continuous shade and cooler walking conditions.

WH 3.3 In parking areas, grade pavements toward properly designed depressed landscape islands and perimeter basins rather than drive aisles.

WH 3.4 Along roadways, use bioswales, rain gardens, curb cuts, or curb extensions to intercept gutter flow and irrigate street trees.

WH 3.5 On industrial sites, use larger basins and pre-treatment where runoff volumes or pollutant loads are higher. Select appropriate microbiotic consuming plants for basin and swale bottoms to clense the water as it percolates into subsoils.

WH 4 Prioritize passive water harvesting systems.

WH 4.1 Use grading, curb cuts, and drainageways to feed depressed landscaped areas, bioswales, and rain gardens as the primary strategy.

WH 4.2 Add cisterns, tanks, or underground storage only where roof catchment, irrigation demand, or space constraints justify active systems.

Passive and Active Water Harvesting

Passive Systems

Systems that slow, capture, and direct water into the landscape for on-site infiltration and reuse at the surface.

- Bioswales, rain gardens, and tree trenches
- Bioretention areas
- Permeable pavements
- Curb extensions and curb cuts with sediment traps
- Street planters and other vegetated basins

Maintenance

Pros

- Easy to observe and inspect; most issues are visible at the surface.
- Fewer mechanical components, reducing risk of sudden failure.
- Routine maintenance can be done with basic tools and skills.
- Lower upfront costs and generally easier to retrofit.
- Vegetated systems support habitat, shade, and visual quality.

Cons

- Performance declines if sediment, trash, or vegetation are not routinely managed.
- Require surface space, which can be difficult on constrained or dense sites.
- May require more frequent manual cleanouts of trash, debris, and sediment.

Active Systems

Systems that collect and store water for later use, often requiring pumps, controls, or manual redistribution.

- Above-ground and below-ground cisterns
- Rain barrels and modular storage tanks
- Rainwater capture systems, first-flush diverters, and filters
- Pumps, valves, and control equipment associated with storage

Maintenance

Pros

- Stores water for intentional reuse.
- Works well on compact or urban sites with limited surface area for basins.
- Helps meet water conservation or reuse objectives.
- Storage volume can be scaled vertically or underground to achieve higher capacities on small sites.

Cons

- Harder to access and monitor; many components are out of sight or underground.
- Requires specialized equipment and technical knowledge to operate and maintain.
- More mechanical parts increase potential for malfunction or service interruption.
- Higher installation and replacement costs, with more complex design and coordination.

STORMWATER CONTEXT & PERFORMANCE

Respond to Scottsdale's rainfall patterns, drainage behavior, and soil conditions so water-harvesting systems reliably capture, infiltrate, and store runoff to support shade and landscape health.

WH 5 Apply a standard GSI toolbox to achieve predictable performance.

WH 5.1 Select from defined GSI practices as detailed on pages 66 - 75.

WH 5.2 Combine multiple practices where needed to meet capture, infiltration, and storage targets for larger drainage areas - together, these form a treatment train.

WH 6 Size systems to capture the first flush (at minimum) to manage runoff and support shade.

WH 6.1 Size GSI features to capture and infiltrate a minimum of 0.5 - 1.0 inch of rainfall from the contributing impervious area.

WH 6.2 Increase storage capacity where site area, grading, and infrastructure constraints allow, while maintaining safe overflow conditions.

WH 6.3 Coordinate water-harvesting volumes with anticipated irrigation demand for trees and planting areas.

Vegitated bioswale.

Pedestrian bridge integration with GSI.

UNDERSTANDING SCOTTSDALE RAINFALL

Scottsdale rainfall patterns provide important context for understanding how stormwater moves across different surfaces, why certain areas generate more runoff, and how GSI features can be positioned to capture and use this water effectively.

Rainfall in Scottsdale is limited but can produce meaningful volumes of stormwater during events. The city receives an average of 7.66 inches of rain each year, while some lower-intensity storms provide prolonged infiltration and deep soil recharge, others arrive in short, high-intensity bursts that generate significant runoff across rooftops, roadways, and paved areas. When directed efficiently, this runoff becomes a valuable resource for supporting vegetation, improving soil moisture, and reducing reliance on potable water for irrigation.

Stormwater availability depends on rainfall depth, intensity, and the size and type of the contributing surface. Because many storm events are relatively small, managing the initial 0.5 inch, "first flush" runoff can deliver meaningful water-quality benefits. Hardscape areas such as rooftops, parking lots, and paved corridors shed most of the water they receive; GSI is one method of capturing and treating such before runoff is conveyed to downstream infrastructure. When directed into GSI features, this runoff can also support healthier landscapes by improving plant health, expanding rootable soil moisture, and strengthening Scottsdale's broader shade infrastructure.

Rainfall & Water Harvesting

Stormwater captured from built surfaces can provide supplemental moisture for trees and landscape areas. For example, a 25,000-square-foot asphalt parking lot can generate approximately 152,000 gallons of runoff per year if directed to GSI features.

Capturing this water reduces runoff, replenishes soil moisture, and helps planted areas perform more effectively.
When used as a local resource, rainfall supports healthier, longer-lived landscapes and strengthens the cooling benefits of Scottsdale's shade system.

Typical Storm Depth Across Scottsdale

Rainfall data collected from five Flood Control District of Maricopa County monitoring stations across Scottsdale indicate that the 90th percentile rainfall depth is consistently 1", representing the type of storm event that GSI features most often experience during heavier rainfall. This storm size provides a reliable basis for planning and sizing water harvesting systems so they function effectively under larger rainfall conditions.

How Stormwater Behaves on Different Surfaces

Stormwater moves differently depending on the surfaces it encounters:

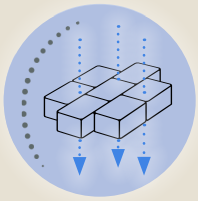
- Impermeable surfaces—such as roadways, rooftops, and parking lots—generate runoff that must be conveyed through gutters, scuppers, or channels.
- Permeable and planted areas allow stormwater to infiltrate the soil, recharge moisture, and support vegetation.
- GSI features help slow, filter, and route this water so it can be used beneficially before reaching storm infrastructure or overflowing to downstream areas.

Understanding how rainfall becomes runoff is essential for determining where water harvesting features should be placed, how they should be sized, and how they work with Scottsdale's landscape and shade systems.

How Does Stormwater Move?

Rain Event

Rainfall begins as precipitation falling across both permeable and impermeable surfaces. Permeable surfaces allow water to infiltrate naturally, while impermeable surfaces generate runoff that is conveyed toward landscape or GSI areas designed to capture it. From there, stormwater may infiltrate into planted areas, be held temporarily in stormwater storage systems, or flow into stormwater drainage infrastructure if excess water cannot be absorbed or stored on-site.



Permeable Surface

Permeable surfaces—such as landscaped areas, rain gardens, bioretention basins, or natural ground—allow stormwater to infiltrate into the soil. As water moves slowly through these areas, it increases soil moisture and supports vegetation. Excess water may continue downslope into other GSI features or planted areas.

Impermeable Surface

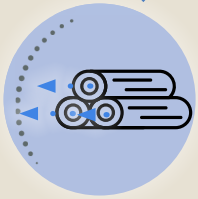
Impermeable surfaces like roofs, roadways, and paved areas do not allow infiltration. Nearly all rainfall landing on them becomes runoff that moves quickly across the surface. Gutters, scuppers, or surface grading then direct this runoff toward permeable areas, planted areas, underground storage, or storm drainage systems.

Planted Areas

Planted areas are the preferred destination for stormwater. Here, water infiltrates the soil, supports root growth, enhances plant health, and reduces irrigation needs. Infiltration in these areas also helps filter pollutants and contributes to cooler microclimates. Excess water may continue downslope into underground storage, or storm drainage systems.

Stormwater Storage

In some systems, stormwater is temporarily captured and held in storage features such as cisterns or underground tanks. Stored water can be used later to irrigate planted areas, helping reduce demand for potable water. Excess water may continue downslope into storm drainage systems.



Stormwater Drainage Infrastructure

Any water that cannot be absorbed or stored on-site eventually flows into storm drainage systems designed to convey excess runoff safely downstream. Properly designed overflow routes ensure GSI features function as intended without causing flooding or damage.

WH 7 Use site-specific drainage and infiltration conditions to set basin dimensions and drawdown times.

WH 7.1 Design basin footprint, depth, and side slopes on contributing drainage area, surface slopes, soil infiltration rates, and available planting area.

WH 7.2 Design water harvesting features so that captured stormwater infiltrates or drains within 36 hours under typical soil conditions to meet county vector control requirements.

WH 7.3 Maintain adequate separation from buildings, utilities, and pavement subgrades.

WH 8 Route runoff to protect water quality and adjacent infrastructure.

WH 8.1 Provide pre-treatment elements—such as sediment forebays, stabilized inflow points, or trench drains—where higher sediment or pollutant loads are expected

WH 8.2 Convey stormwater from pre-treatment into infiltration or filtration features, then to clearly defined overflow or outfall locations sized for larger storm events.

WH 8.3 Stabilize inflow and outfall points to prevent erosion, protect nearby improvements, and maintain long-term system performance.

Rainfall Capture Calculator

Use this quick tool to estimate how much runoff a typical, larger Scottsdale storm can provide. Higher gallon values mean that the surface produces more runoff and is a good candidate to divert to water-harvesting systems. Lower gallon values mean less runoff and smaller harvesting opportunities from that surface.

Inputs:

- **Storm Depth** (1 inch): The amount of rain that falls during a single storm, measured in inches. Use 1 inch for a typical larger Scottsdale storm (a 90th-percentile event).
- **Conversion Factor** (0.623): Converts inches of rain on a square foot of surface into gallons. One inch of rain on 1 square foot produces about 0.623 gallons of water.
- **Catchment Area** (square feet): The horizontal area of a hard surface that produces runoff that could drain toward your water-harvesting feature.
- **Runoff Coefficient** (see Table below): The fraction of rain that turns into runoff from a surface. A value of 1.0 means almost all of the rain runs off; 0.5 means about half runs off and half soaks in. To keep it simple, use the value that best matches your surface type.

Formula

Storm Depth × 0.623 × Catchment Area × Runoff Coefficient = Gallons of Runoff

Example

45,000 sq. ft. parking lot, 90th-percentile storm of 1.00”, and a runoff coefficient of 0.95 (pavement):

1.00 × 0.623 × 45,000 × 0.95 ≈ 26,633 gallons from a single storm.

Table

Material	Runoff Coefficient
Roof or covered structure	0.95
Pavement (concrete/asphalt)	0.95
Landscaping (typical turf/soil)	0.50
Vegetable/flower garden	0.35

MAINTENANCE & LONGEVITY

Ensure water-harvesting systems can be maintained and adjusted over time so they continue to function as designed and support healthy trees, shade, and landscapes.

WH 9 Design GSI features for clear visibility and access to support efficient maintenance.

WH 9.1 Locate inlets, outlets, overflow structures, sediment traps, and cleanouts where they are visible from grade and easy to identify in the field.

WH 9.2 Avoid locating key components in locations that would limit access or conceal problems such as clogging or erosion.

WH 10 Select plants and materials that support long-term function and tree health in GSI systems.

WH 10.1 Use desert-adapted plant species, mulch, and surface treatments that tolerate periodic inundation, sediment deposition, and drought conditions.

WH 10.2 Avoid species and materials that are likely to clog inlets, permeable pavements, or outlet structures with excessive litter, thatch, or aggressive root systems (e.g., tree species that drop seedpods or large leaves, fine sediment or decomposed granite fines).

WH 10.3 Coordinate plant selection, soil amendments, and mulch types with the intended maintenance approach (e.g., hand tools vs. mechanized equipment).

WH 10.4 Where infiltration is desired, use soils and other media that balance permeability, moisture retention, and plant health.

WH 11 Establish inspection and maintenance schedules and assign responsibilities for each GSI practice.

WH 11.1 Define inspection frequencies (e.g., after major storms, seasonally, and annually) appropriate to each GSI feature type.

WH 11.2 Identify specific routine tasks such as sediment removal, trash and debris clearing, vegetation management, mulch replacement, and surface vacuuming for permeable pavements.

WH 12 Monitor system performance and adjust maintenance or design details as conditions change.

WH 12.1 Modify maintenance practices, plant palettes, or specific design details (e.g., rock armoring at inlets, sediment trap sizing, overflow protection) when field conditions show that adjustments are needed to maintain performance.

WH 12.2 Conduct periodic assessments of structural components and vegetation health to confirm ongoing functionality of water-harvesting systems.

GSI PRACTICES

Effective water harvesting depends on choosing the right mix of GSI features for the site, capturing and treating stormwater as close as possible to where it falls, slowing runoff to promote percolation and absorption, and linking multiple practices together as "treatment trains" so water is managed in stages as it moves downstream. Well-designed systems maximize stormwater capture, support vegetation, and improve outdoor comfort.

Permeable Pavement

Passive GSI practice

Permeable pavement is a paved surface that allows stormwater to pass through joints or pores into a gravel storage layer and underlying soil. It reduces runoff, supports nearby trees, and helps recharge the ground.

Benefits

- Reduces surface runoff by promoting on-site infiltration.
- Provides subsurface storage and slow release of stormwater.
- Supports tree and planting health by increasing soil moisture.
- Can reduce the need or size of separate surface basins.
- Useful in retrofits where surface space is limited, and low/moderate vehicular areas.

Use Case

- Parking stalls or parking bays with light to moderate traffic.
- Sidewalks, multi-use paths, courtyards, and pedestrian plazas.
- Avoid heavy vehicles and areas of increased vehicular traffic.

Maintenance Considerations

- Vacuum sweep the surface twice a year to remove fine sediment from joints or pores.
- Inspect after storms for ponding, clogged areas, loss of infiltration, or surface damage.
- Remove weeds and debris from joints and edges without damaging the surface.
- Repair settled, cracked, or displaced units and replenish joint or infill material as needed.

Permeable interlocking concrete pavers.

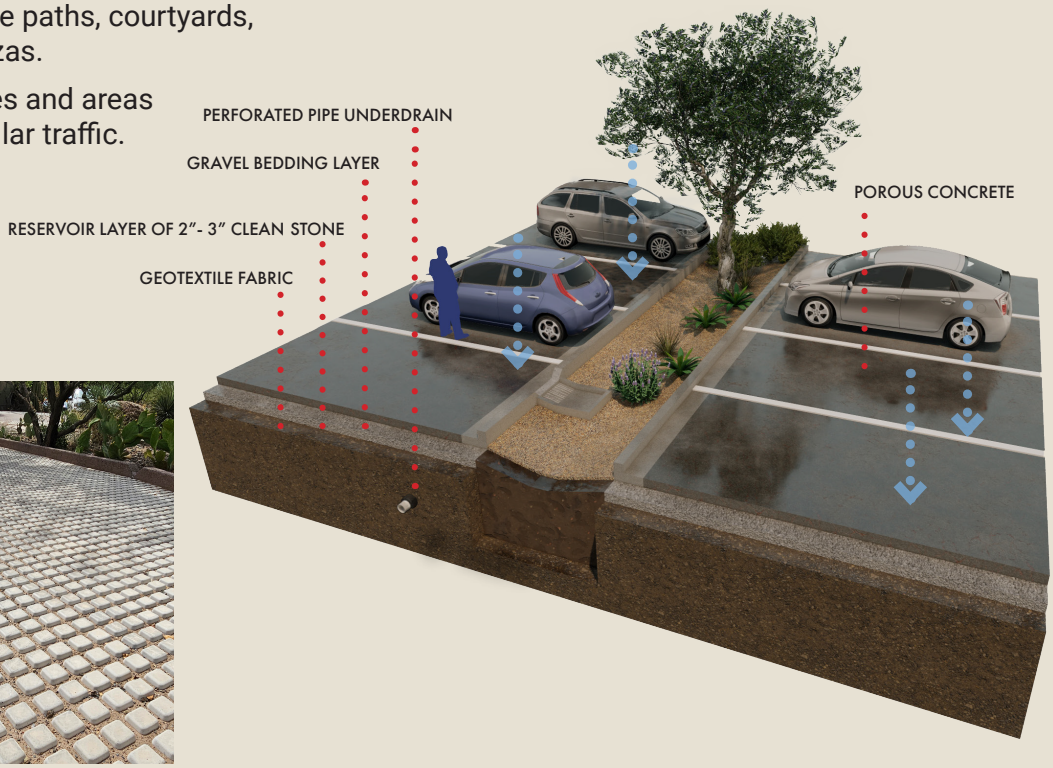


FIGURE 2-1. PERMEABLE PAVEMENT.

PHOTO AT BOTTOM REPLACED WITH A MORE ACCURATE EXAMPLE OF A CURB CUT AND LANDSCAPE BASIN.

Curb Openings, Curb Cuts, & Sediment Traps

Passive GSI practice

Curb cuts are openings in the curb that let stormwater leave impermeable surfaces and flow into adjacent landscape basins. Sediment traps are shallow depressions or rock pockets at the inlet that slow water and capture debris before it reaches planted areas.

Benefits

- Directs runoff from paved areas into basins, bioswales, or rain gardens.
- Reduce localized street and parking-lot flooding.
- Protect downstream GSI features by capturing sediment, trash, and leaf litter.
- Simple, low-cost elements suitable for both new and retrofit projects.

Use Case

- Along streets and within parking lots, draining into landscape islands or basins.
- Within curb extensions and stormwater planters as part of traffic-calming projects.
- Within civic or commercial plazas.

Maintenance Considerations

- Keep curb openings clear of trash, leaves, sediment, and overgrown plants so water can enter freely.
- Remove accumulated sediment and debris from sediment traps and forebays twice a year to maintain capacity.
- Check rocks or splash pads at outlets for erosion or undercutting and repair as needed.
- Watch for blocked inlets, full sediment traps, and erosion at discharge points.
- Replace fill materials as needed.

Curb cut and bioswale.

Curb cut and landscape basin.

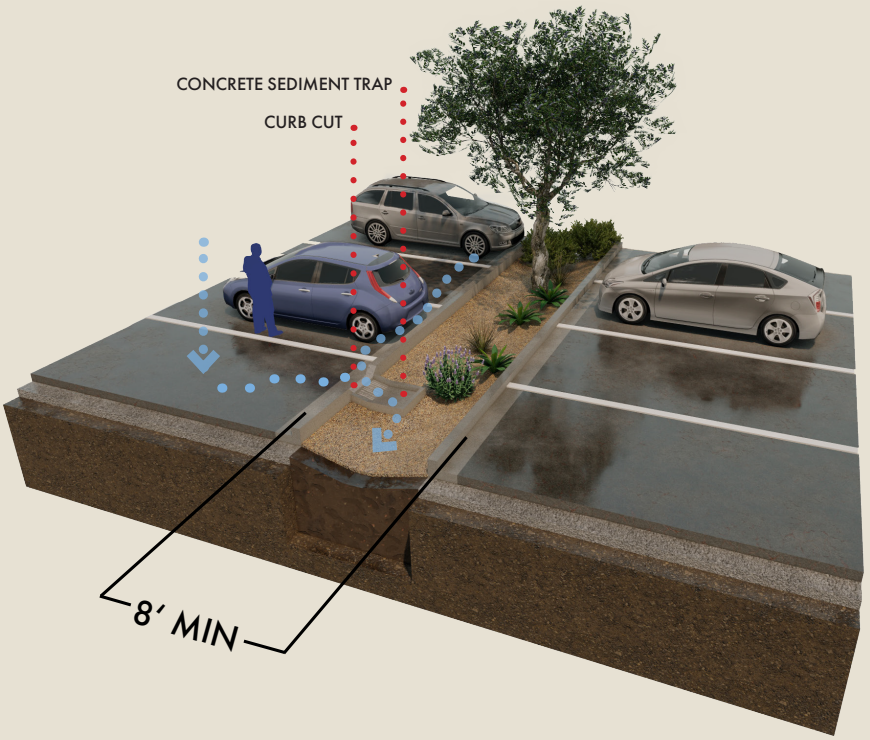


FIGURE 2-2. CURB OPENINGS, CURB CUTS, & SEDIMENT TRAPS.

Suspended Pavement

Passive GSI practice

Suspended pavement systems, SUCH AS SOIL CELLS, support sidewalks, plazas, or parking areas on a structural deck or frame so that soil beneath remains largely uncompacted and usable for tree roots and stormwater infiltration. They often work with structural soils ~~or soil-cell systems~~ to provide both loading capacity and high-quality rooting volume.

Benefits

- Provides substantial rooting volume for street and plaza trees beneath paved areas.
- Reduces pavement heaving and cracking caused by shallow surface roots.
- Allows stormwater to be directed into soil below pavement for infiltration and tree uptake.
- Supports larger, mature trees that provide significant shade and cooling.

Use Case

- Urban streetscapes, often as continuous tree trenches along sidewalks.
- Plazas, courtyards, and transit stops with trees integrated into paved areas.
- Parking lots or drop-off areas where trees are surrounded by pavement.

Maintenance Considerations

- Monitor tree health (canopy vigor, dieback, rooting issues) and adjust irrigation or soil management as needed.
- Inspect adjacent pavement for settlement, cracking, or trip hazards and repair as needed.
- Keep surface inlets, openings, or adjacent planting areas clear so water can reach the structural soil zone.
- Avoid heavy equipment or activities that exceed the system's design loading over root zones.
- Watch for poor tree performance or localized pavement failure that may indicate issues within the system.

Suspended pavement soil cells.

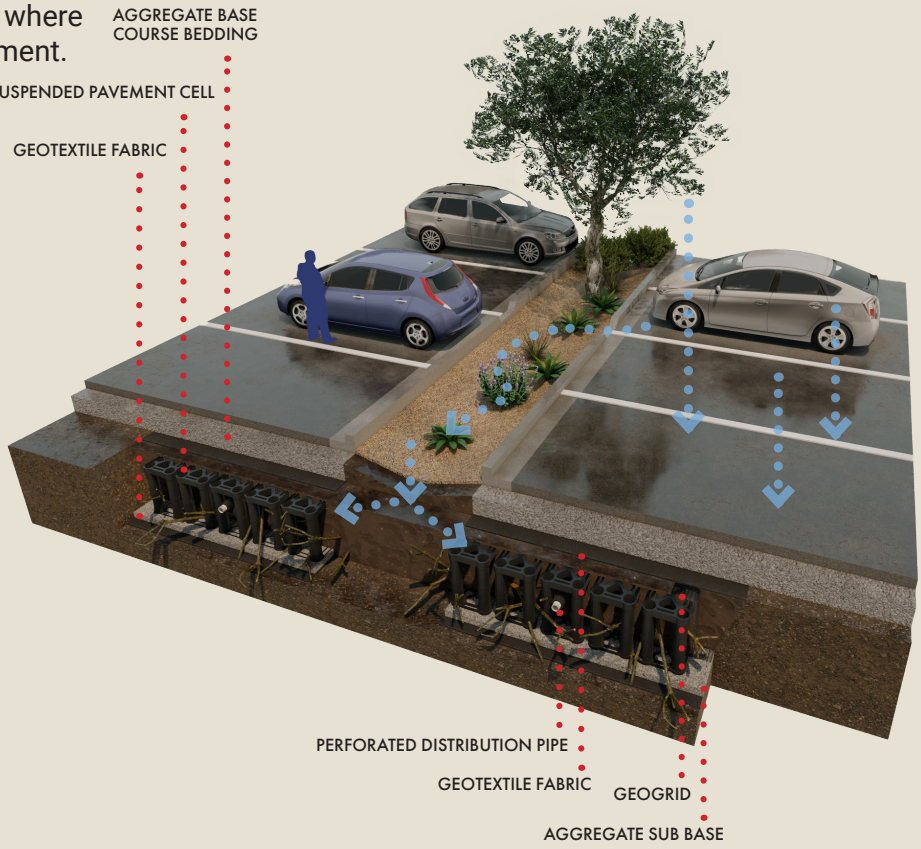


FIGURE 2-3. SUSPENDED PAVEMENT.

Structural Soil

Passive GSI practice

Structural soil is an engineered mix (typically angular stone with a soil component) designed to support pavement loads while still providing limited rooting space for trees. It allows tree roots to grow under or adjacent to pavement where conventional, uncompacted soil is not feasible.

Benefits

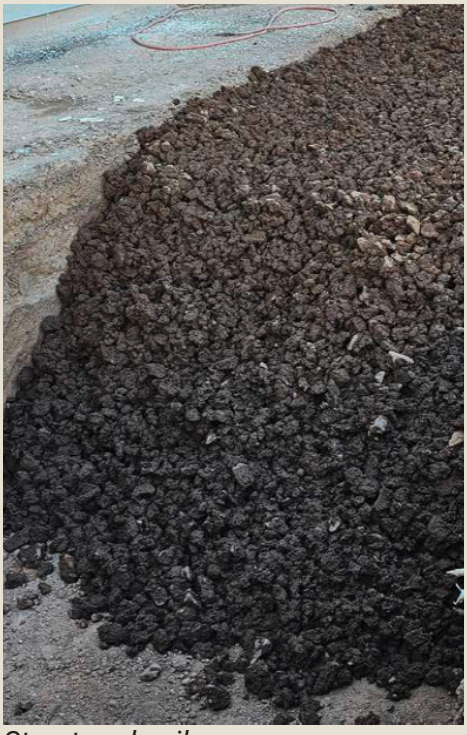
- Provides rootable volume in locations that must also support pavement or light vehicular loads.
- Reduces pavement heaving and cracking caused by shallow surface roots.
- Can be used to connect tree wells or create tree trenches, improving root spread and stability.
- Useful in retrofits where existing subgrade conditions constrain planting options.

Use Case

- Beneath sidewalks or plaza paving between tree wells.
- In narrow furnishing zones or medians where space for open soil is limited.
- Around street trees adjacent to parking lanes or drop-off areas where trees are surrounded by pavement.

Maintenance Considerations

- Monitor tree health (canopy vigor, dieback, stability) to confirm that rooting conditions are adequate. Poor tree performance may signal the need for soil remediation or additional rooting volume.
- Inspect adjacent pavement for settlement, cracking, or trip hazards and repair as needed.
- Keep surface inlets, openings, or adjacent planting areas clear so water can reach the structural soil zone.
- Avoid over-compacting surface areas beyond intended design loads, which can further restrict rooting and infiltration.



Structured soil.

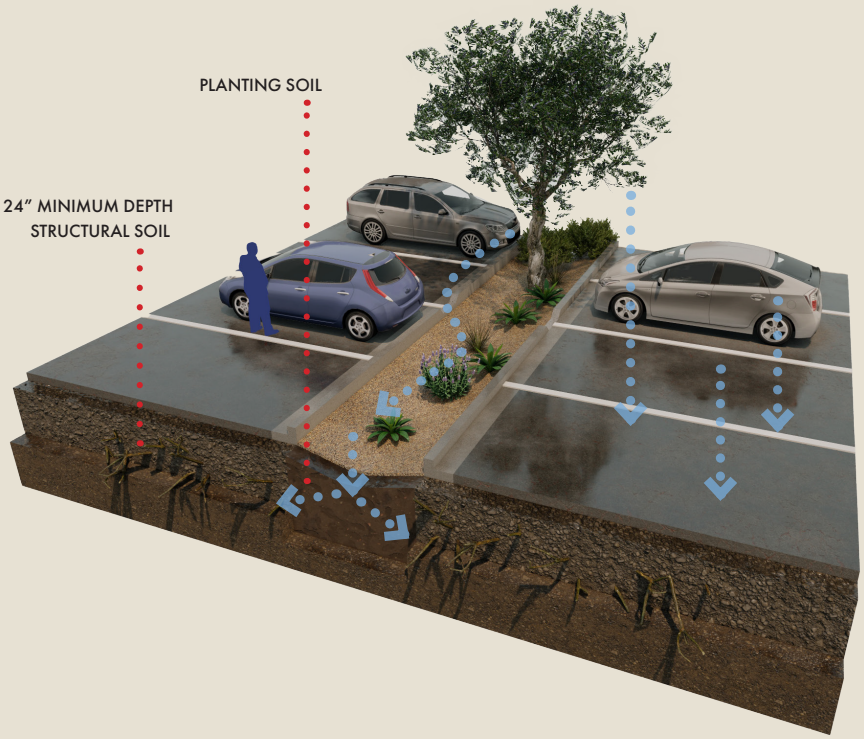


FIGURE 2-4. STRUCTURAL SOIL.

Bioswale

Passive GSI practice

A bioswale is a shallow, gently sloped, vegetated channel that slows, filters, and absorbs stormwater as it moves across a site. Water spreads out through the swale, allowing sediment to settle and pollutants to be filtered by soil and plants before infiltrating or flowing to another GSI feature.

Benefits

- Moves and captures stormwater on the surface instead of in pipes.
- Provides cost-effective, passive drainage for large contributing areas.
- Filters sediment and pollutants through soil and vegetation.
- Supports desert-adapted planting, shade, and habitat along streets and edges.

Use Case

- Adjacent to streets and within medians.
- Parking lot edges and between parking bays.
- Larger swales in parks, campuses, and open space areas.
- Along multi-use paths or at the base of sloped landscaped areas.

Maintenance Considerations

- Remove trash, leaves, and sediment from inlets, forebays, and low points—especially after monsoon or large rain events.
- Regrade compacted or eroded areas and replenish decomposed granite or rock in high-flow zones to restore flow and infiltration.
- Prune or replace vegetation to maintain clear flow paths and visibility while keeping good plant cover.
- Watch for common issues such as blocked inlets, dead or overgrown vegetation, erosion, and mulch washing out of the swale.

Bioswale.

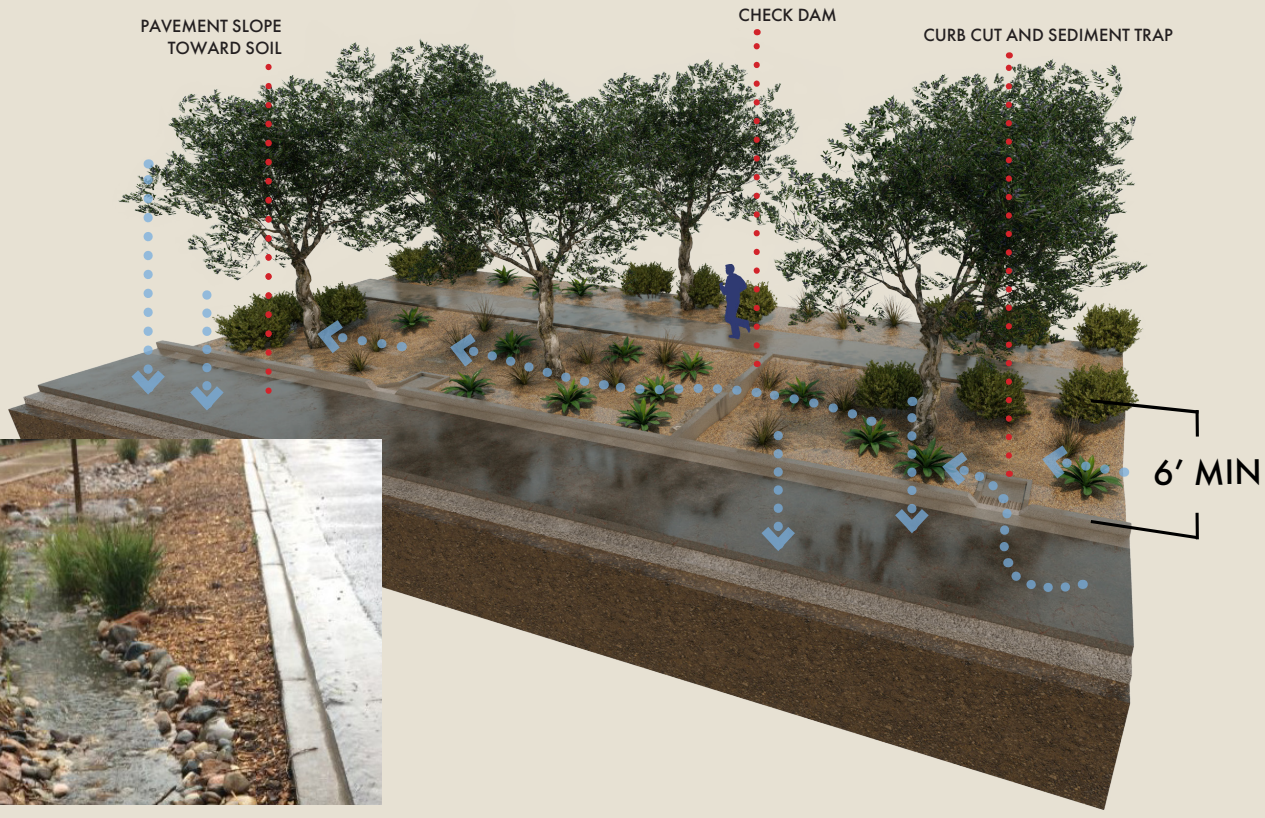


FIGURE 2-5. BIOSWALE.

Rain Garden

Passive GSI practice

A rain garden is a shallow, planted basin that captures runoff from nearby roofs, sidewalks, or paved areas and allows water to pond temporarily, soak into the soil, and be taken up by plants. It is typically smaller and more contained than a bioswale, serving as a focal landscape feature as well as a stormwater facility.

Benefits

- Captures and infiltrates runoff close to where it falls.
- Reduces peak flow and erosion by slowing and storing water on-site.
- Filters sediment and pollutants through soil and vegetation.
- Supports desert-adapted plants, shade, habitat, and visual interest in small spaces.

Use Case

- At roof downspouts near building entries or courtyards.
- In parking lot islands or along the edges of small lots.
- Along sidewalks, multi-use paths, or between buildings.
- In residential or neighborhood-scale landscape areas.

Maintenance Considerations

- Remove trash, leaves, and sediment from inlets, forebays, and the basin surface—especially after storms.
- Replace dead or stressed plants and prune as needed to maintain coverage, sightlines, and clear inflow paths.
- Replenish mulch or surface treatments that wash out or break down over time.
- Repair localized erosion at inlets or overflows and regrade low spots if needed to restore even ponding and infiltration.
- Watch for common issues such as bare or compacted soil, persistent standing water, and declining vegetation.

Rain garden.

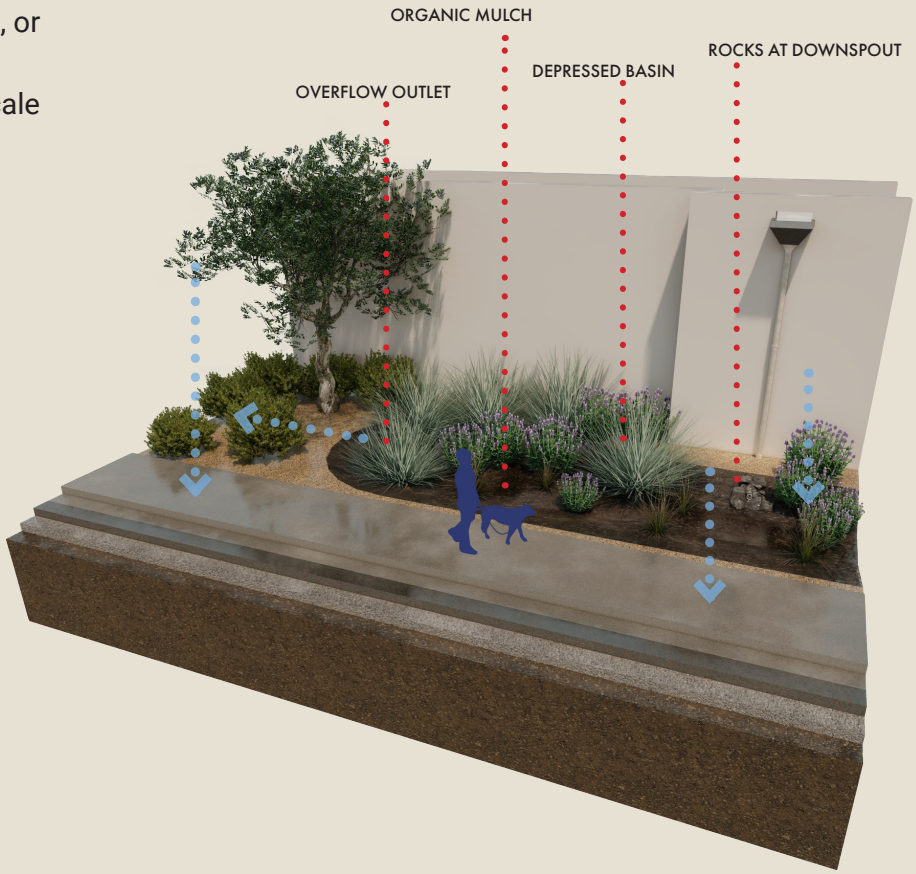


FIGURE 2-6. RAIN GARDEN.

Pedestrian Bridge

Access over GSI features

Pedestrian bridges or grates span bioswales, rain gardens, or basins to maintain continuous walking routes while leaving the underlying GSI feature open to water, light, and air. They provide crossings in specific locations to protect vegetation and soils from compaction.

Benefits

- Provides safe, accessible crossings over GSI features.
- Protects planted areas and soil structure by limiting informal footpaths.
- Allows stormwater to continue flowing and infiltrating beneath the structure.
- Can be integrated as a visible design element along streetscapes and trails.

Use Case

- Across bioswales or rain gardens along sidewalks and multi-use paths.
- Between parking lots and building entries where GSI features run parallel to walkways.
- At access points in plazas, courtyards, or parks with linear basins.

Maintenance Considerations

- Keep bridge decks and grates clear of leaves, trash, and sediment so water and light can pass through.
- Inspect rails, supports, and fasteners for damage, corrosion, or trip hazards and repair as needed.
- Check approaches and abutments for erosion, settlement, or ponding and stabilize if required.
- Ensure the underlying GSI feature remains accessible for vegetation care and sediment removal.

Pedestrian bridge over bioswale.

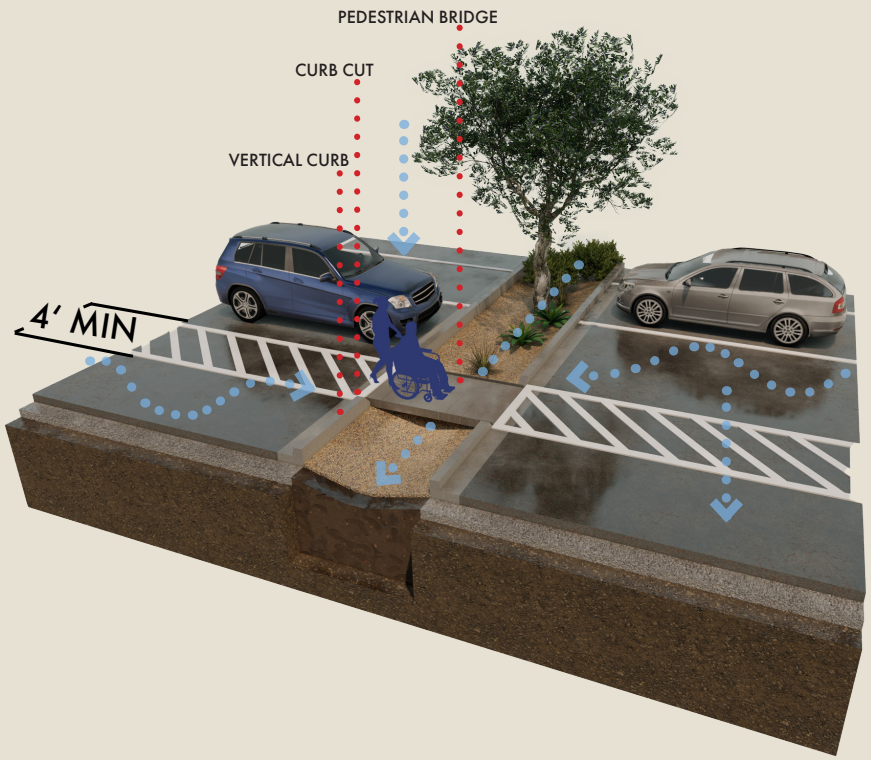


FIGURE 2-7. PEDESTRIAN BRIDGE.

Curb Extension

Can be combined with other GSI features

A curb extension narrows the roadway to slow traffic and shorten pedestrian crossing distances, while inlets - typically curb cuts with sediment traps - capture gutter flow. When combined with basins, bioswales, or rain gardens, curb extensions direct stormwater into planted areas.

Benefits

- Calms traffic and improves visibility at crossings.
- Reduces pedestrian crossing distance and exposure to vehicles.
- Captures and infiltrates street runoff in integrated planting areas.
- Provides opportunities for trees, shade, and streetscape greening.

Use Case

- In streetscapes, at intersections, or mid-block crossings.
- Near schools, transit stops, and commercial main streets.
- In traffic-calming projects.

Maintenance Considerations

- Keep inlets, curb cuts, and gutter approaches clear of trash, leaves, and sediment so water can enter the extension.
- Remove accumulated sediment and debris from the planted basin and any forebays to maintain capacity.
- Maintain plants, mulch, and soil to prevent bare spots, overgrowth, or blocked sightlines for pedestrians and drivers.
- Inspect curb edges, pavement, and accessible routes for settlement, cracking, or trip hazards and repair as needed.

Curb extension with curb cut and bioswale.

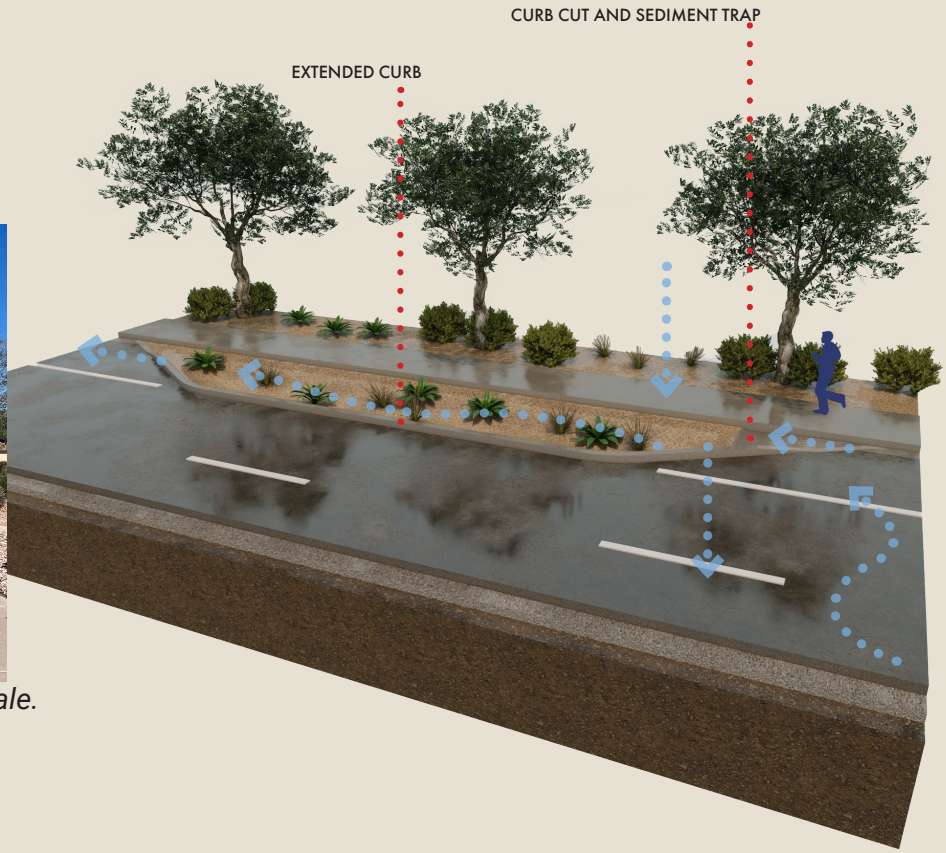


FIGURE 2-8. CURB EXTENSION.

Above Ground Cistern

Active water harvesting practice

An above-ground cistern is an enclosed tank that collects and stores stormwater, typically from roof downspouts, for later non-potable use such as landscape irrigation. It is visible at the surface and includes inlets, overflows, and outlets or hose connections.

Benefits

- Stores captured rainwater for intentional reuse.
- Works well on sites with limited space for basins or swales.
- Can be located and detailed as an educational or design feature.
- When combined with passive GSI, helps extend water availability for trees and planting.

Use Case

- Near building downspouts in courtyards, side yards, or service areas.
- At commercial or civic buildings where tanks can be integrated into façades or screened enclosures.
- In schools, parks, and community facilities as demonstration systems.

Maintenance Considerations

- Keep inlet screens, gutters, and first-flush devices clear of leaves, sediment, and debris.
- Inspect the tank, fittings, and supports for leaks, corrosion, and structural stability.
- Check overflows and splash pads to ensure water is safely conveyed away from buildings and accessible routes.
- Periodically drain and clean the cistern to remove accumulated sediment and organic material.
- Ensure lids, vents, and screens remain secure to prevent mosquitos, algae, animal entry, and safety hazards.
- For pumped systems, test pumps, valves, and controls regularly.

Above ground cistern.

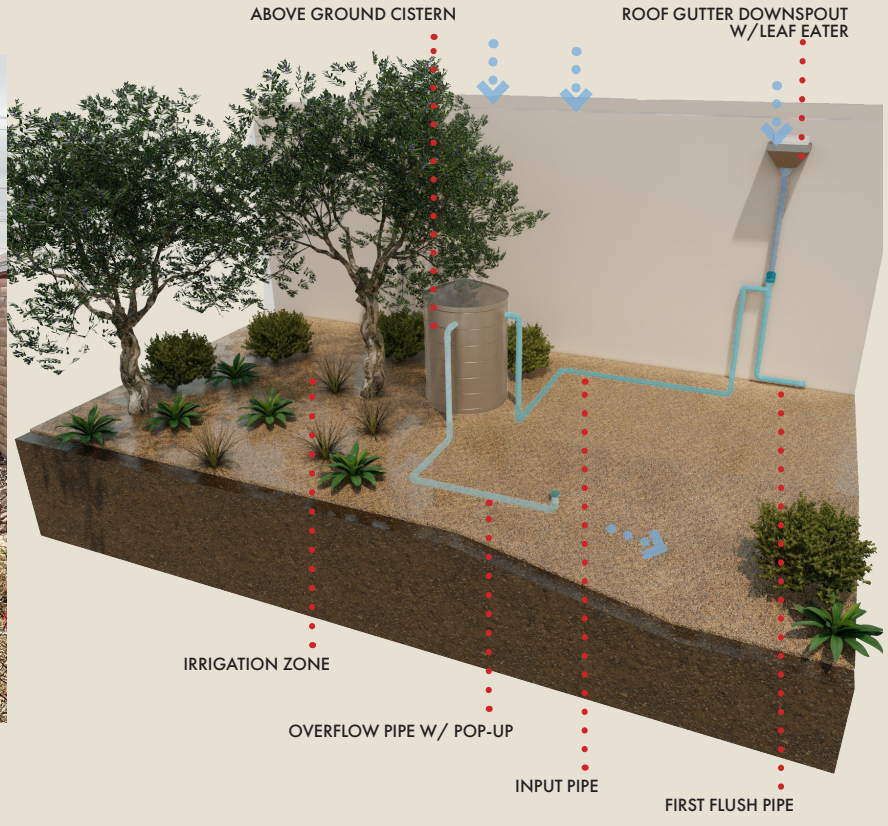


FIGURE 2-9. ABOVE GROUND CISTERN.

Below Ground Cistern

Active water harvesting practice

A below-ground cistern is a buried tank that collects stormwater, typically from roof drains or surface inlets, for later non-potable use such as landscape irrigation. It is concealed below grade and includes access hatches, inlets, overflows, and outlet piping or pump connections.

Benefits

- Stores significant volumes of captured rainwater without using surface space.
- Preserves usable area for parking, plazas, or playgrounds while providing water storage.
- Helps reduce peak runoff and potable water demand for irrigation.
- Can be paired with passive GSI features that receive overflow or supplemental irrigation.

Use Case

- Sites with limited above-ground space.
- Under parking lots, plazas, or courtyards near contributing roofs.
- Beneath landscape areas where tanks or modular units can be covered by soil and planting.
- At commercial, civic, or institutional sites with larger roof areas and irrigation needs.

Maintenance Considerations

- Inspect inlets, pretreatment devices, and access risers for sediment, trash, and blockages.
- Periodically remove accumulated sediment and organic material in the tank.
- Check pumps, valves, float switches, and control systems regularly to confirm operation.
- Check overflows and splash pads to ensure water is safely conveyed away from buildings and accessible routes.
- Inspect lids, hatches, and vents.
- Settlement, surface cracking, or sinkholes above the cistern may indicate structural or subsurface issues.

Below ground cistern.

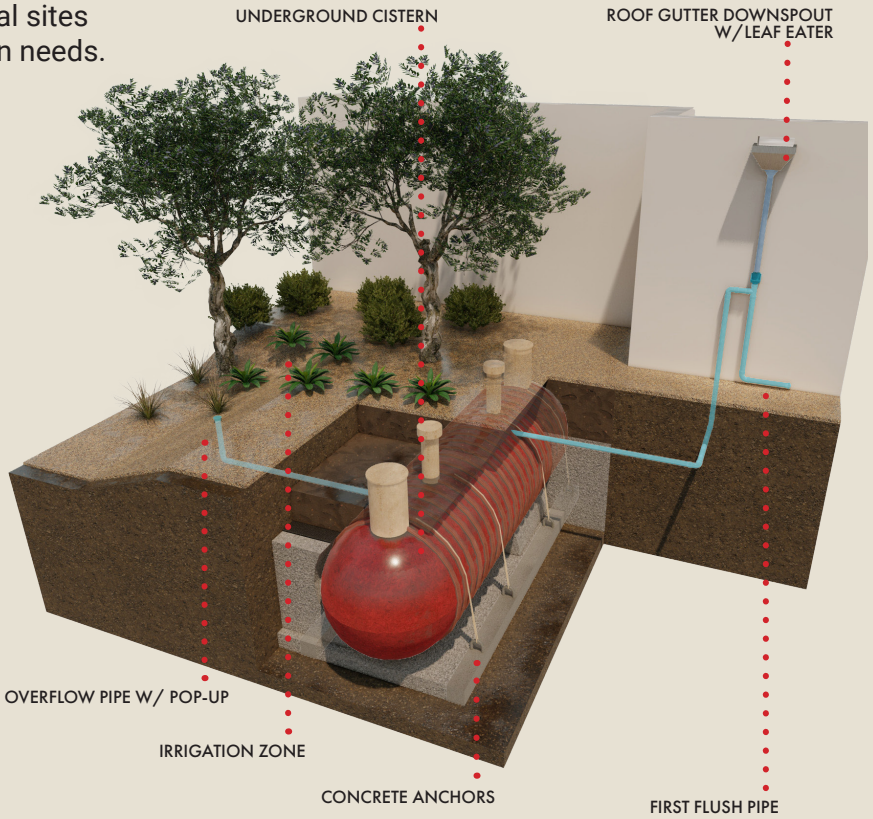


FIGURE 2-10. BELOW GROUND CISTERN.

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SHADE STRUCTURES

Shade structures are a vital component of Scottsdale's citywide approach to comfort, livability, and heat resilience. Together with trees and landscape design, they form the city's built canopy system, expanding usable outdoor spaces, improving comfort, and enhancing visual quality in both public and private settings.

This section provides technical guidance and design direction for integrating shade structures in Scottsdale. While trees remain the city's primary source of natural canopy, built structures play an essential complementary role, offering immediate, durable shade in areas where vegetation is limited or where high activity levels demand year-round comfort.

The Shade Structure Guidelines establish a unified framework for designing, locating, and maintaining shade structures that respond to Scottsdale's climate, architectural character, and community expectations. They are intended to inform project planning and review, ensuring that new and retrofitted structures contribute to broader shade goals.

Well-designed shade structures extend the usability of public and private spaces, promote outdoor activity, and contribute to shade goals. These guidelines balance function, aesthetics, and performance, ensuring that structural shade integrates seamlessly with surrounding landscape, architecture, and site design.

Design and Implementation Framework

The Shade Structure Guidelines outline expectations for coverage, performance, and material resilience, while allowing flexibility for innovation and context-sensitive solutions. Rather than prescribing a single style, they establish a shared understanding of what effective, functional, and durable shade looks like across Scottsdale.

This framework complements the Trees and Water Harvesting Guidelines, together forming the three technical foundations of the Shade & Tree Plan. Each works in tandem—the tree canopy providing natural cooling and ecological benefits, the shade structures supplying immediate and adaptable protection, and the water harvesting systems ensuring efficient irrigation and runoff capture.

Partial shade reduces direct midday sun.

The Shade Structure Guidelines provide detailed direction organized under three primary categories:

Functional Design & Orientation defines how shade structures should be positioned and configured to respond to solar conditions. It introduces principles for analyzing sun angles, determining optimal placement, and achieving effective shade coverage at peak heat hours.

Integration & Context establishes how shade structures relate to their surrounding environment, including trees, landscapes, buildings, and public spaces. It emphasizes consistency, visibility, pedestrian comfort, and coordination with utilities, circulation, and architectural character.

Materials & Maintenance outlines recommended material types, coatings, and construction methods suited to Scottsdale's desert climate. It provides guidance on durability, heat performance, and long-term maintenance practices that ensure structural safety and lifespan.

Shade Canopy Balance

The most effective shade ~~networks~~ DESIGNS layer tree canopy and shade structures to maintain coverage consistency throughout the day and across seasons.

FUNCTIONAL DESIGN & ORIENTATION

Design shade structures to respond to solar patterns, reinforce site function, and work with natural canopy to provide effective, comfortable, and well-oriented shade where people need it most.

SS 1 Design shade structures to respond to sun path.

SS 1.1 Prioritize south- and west-facing areas for shade coverage.

SS 1.2 Incorporate both horizontal and vertical shading elements to address shifting solar angles — vertical structures for morning and late-afternoon sun, and overhead structures for midday protection.

SS 1.3 Optimize shade coverage between 10 a.m. and 4 p.m.

SS 1.4 Assess seasonal shade patterns to ensure maximum summer protection while providing intentional winter solar exposure.

Overhead shade structure provides midday protection.

SS 2 Balance shade structures with natural canopy to achieve site coverage goals.

SS 2.1 Provide a minimum of 50% shade coverage over hardscape surfaces through a combination of trees at maturity and structures.

SS 2.2 Place structures to strengthen overall shade coverage and serve sites where tree planting or root space is limited.

SS 2.3 Coordinate structural placement with water-harvesting and irrigation systems to prevent conflicts and ensure trees can grow and function alongside structures to meet sitewide shade coverage goals.

Shade structures and tree canopy strengthen shade coverage.

HORIZONTAL SHADE

Horizontal shade structures moderate direct overhead sunlight by creating cool, usable spaces during the hottest portions of the day. Their effectiveness depends on how well they are aligned with activity patterns, seasonal comfort needs, and sun path.

Paired with vertical elements, horizontal shade ensures consistent comfort across the solar cycle.

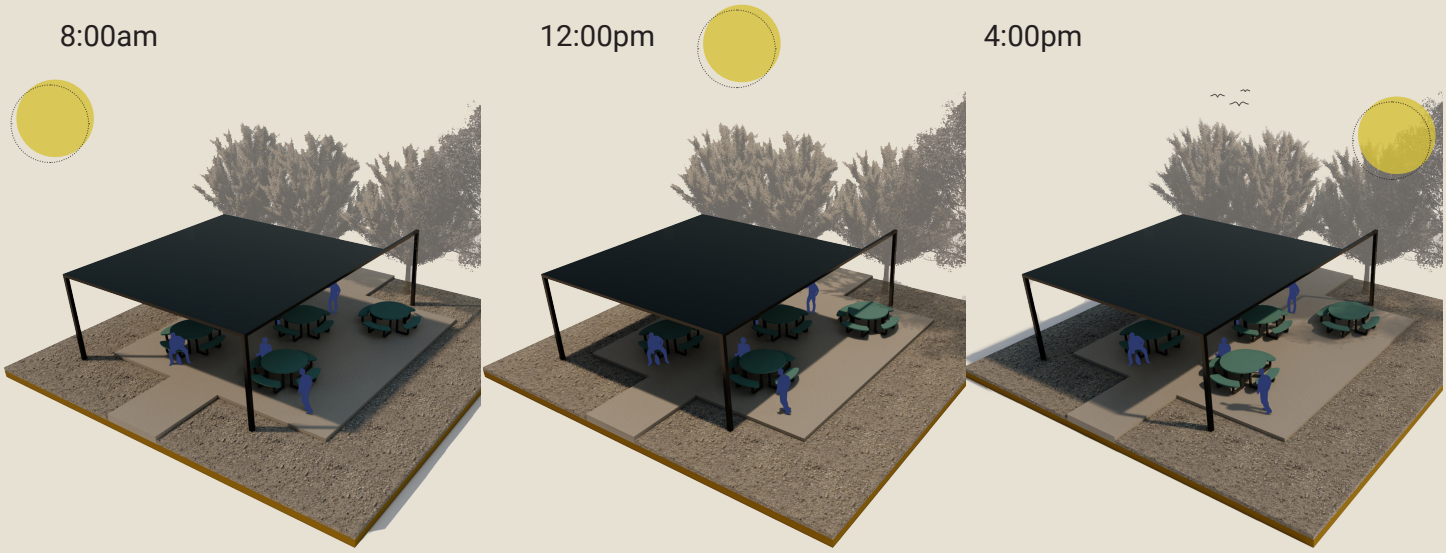


Figure 3-1. Horizontal shade structure performance relative to sun path.

Horzontal Shade

Horizontal shade structures, such as canopies, pergolas, fabric systems, and solar-panel arrays, provide broad overhead protection and are most effective during the middle of the day, when the sun is highest and radiant heat peaks. They are well suited for plazas, walkways, patios, playgrounds, and outdoor seating areas, where reducing direct overhead exposure significantly cools surfaces and improves comfort.

Because the sun's position shifts throughout the day and across seasons, fixed horizontal structures must be carefully placed to align with the intended use of the space. The diagram above demonstrates how a fixed horizontal structure casts shade throughout the day. While this can be effective for midday activity, horizontal systems provide little to no shade in the early morning or late afternoon when the sun is low on the horizon.

Louvered Shade Systems: A Flexible Year-Round Strategy

Louvered systems offer adaptable, climate-responsive shading across seasons. By adjusting tilt, spacing, or rotation, louvers can balance effective summer shade with desirable winter sunlight, supporting year-round comfort, visibility, and usability. Their flexibility makes them well-suited for plazas, walkways, seating areas, and other locations with continuous activity throughout the year.

VERTICAL SHADE

Vertical shade elements target the low-angle morning and late-afternoon sun, reducing glare and heat when overhead structures offer limited protection. Their effectiveness depends on how they are oriented in relation to the sun's path and nearby site features, particularly along southwest and west exposures.

Used alongside horizontal shade, vertical elements complete the full range of daily sun protection.

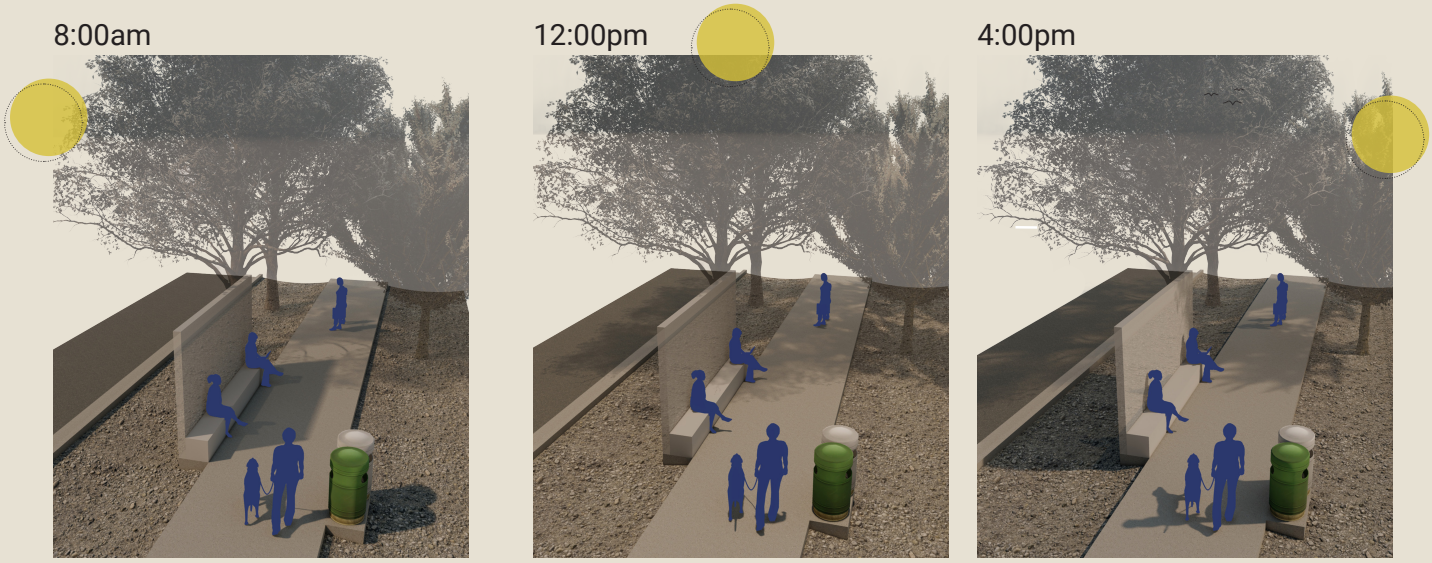


Figure 3-2. Vertical shade structure performance relative to sun path.

Vertical Shade

Vertical shade elements are highly effective at blocking low-angle morning and late-afternoon sun, when heat and glare are most intense. Their performance relies on proper placement, further, vertical screens, slats, and louvers should be oriented perpendicular to southwest and west-facing exposures to intercept the strongest sun angles while maintaining airflow and visibility.

The diagram above illustrates how orientation influences shadow patterns throughout the day. Aligning vertical elements with the sun's path during these periods significantly improves shade coverage and comfort.

To maintain safety and clear sightlines, especially in public spaces, vertical shade features should provide at least 60% openness, allowing for adequate transparency, ventilation, and surveillance.

SS 3 Design shade to enhance pedestrian comfort and connectivity.

SS 3.1 Use shade structures to link major pedestrian routes and activity areas—including transit stops, crossings, seating, playgrounds, and building entrances—~~in~~to ~~a~~ PROVIDE continuous shade ~~network~~.

SS 3.2 Integrate seating and lighting within shade structures to improve comfort and usability.

SS 3.3 Avoid obstructing important sightlines for visibility, particularly near intersections and active plazas.

SS 4 Provide shade levels appropriate to the use, comfort needs, and exposure of the site.

SS 4.1 Provide **Full Shade** in high-exposure or high-dwell-time areas.

SS 4.2 Provide **Partial Shade** in moderate-activity locations.

SS 4.3 Provide **Filtered Shade** in open, transitional, or visually sensitive environments.

SS 4.4 Select shade levels based on expected user duration, directional exposure, orientation, and surface material temperatures.

SS 4.5 Use layered shade (structures and trees) in high-demand areas to maintain comfort throughout the day and across seasons.

Shade ~~Levels & Location~~ TYPES

Shade types vary in performance and purpose. Selecting the appropriate shade ~~level~~TYPE ensures comfort, usability, and alignment with Scottsdale's heat conditions and site needs.

Full Shade

Maximum sun protection, making spaces significantly cooler.

- Playgrounds
- Transit stops
- Outdoor seating
- Building entrances

Partial Shade

Reduces direct midday sun and allows some sunlight in the morning or late afternoon.

- Community parks
- Outdoor dining and seating
- Major pedestrian routes

Filtered Shade

Dappled lighting maintains natural brightness and visibility, while still cooling an area.

- Neighborhood walkways and playgrounds
- Art plazas
- Scenic view corridors

Figure 3-3. Typical shade types and their use.

INTEGRATION & CONTEXT

Align shade structures with surrounding landscape, architecture, and circulation to create cohesive, accessible, and context-appropriate outdoor environments.

SS 5 Integrate shade structures with their site and surrounding environment.

SS 5.1 Locate structures where they complement existing or proposed trees, plantings, and site features, avoiding conflicts with root zones, water-harvesting areas, and on-site stormwater systems.

SS 5.2 Allow at least 15–20 feet of overhead clearance between structural canopies and expected mature tree canopy.

SS 5.3 Design structures to fit the scale and proportion of their setting, maintaining pedestrian scale in walkable environments and larger open spaces.

SS 5.4 Use placement and orientation to support site organization while maintaining functional shade.

SS 6 Coordinate shade structures with adjacent architecture and public realm design.

SS 6.1 Align structure geometry, scale, and materials with adjacent architectural forms to create a unified composition.

SS 6.2 Connect structural canopies to building façades or courtyard edges to maintain continuity of shade and enclosure.

SS 6.3 Complement existing streetscape palettes to maintain visual coherence.

SS 6.4 In civic and commercial settings, use shade structures to transition between interior and exterior spaces.

SS 6.5 Structures should not obstruct sightlines, building entries, or emergency access.

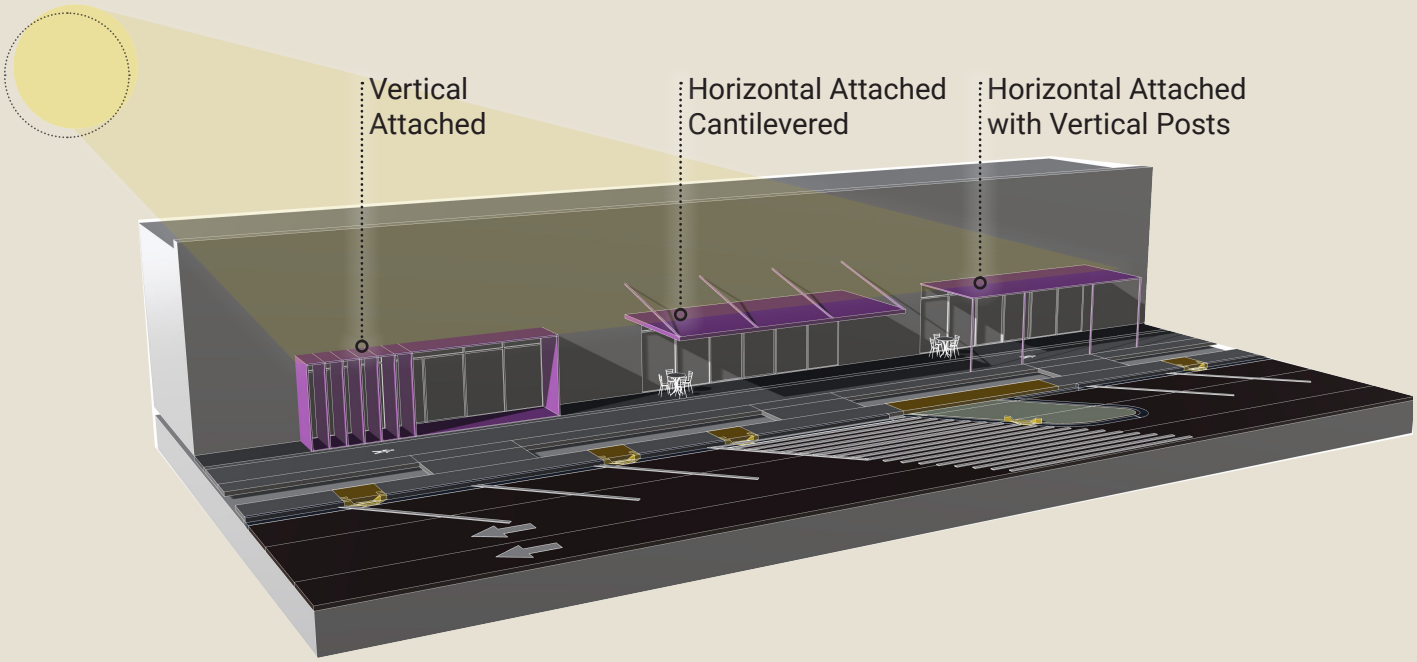


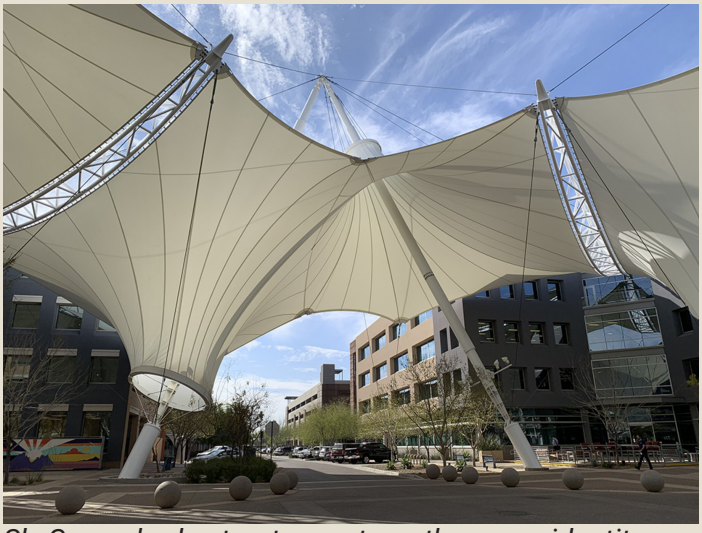
Figure 3-4. Integrating shade structures along a building frontage.

SS 7 Use shade structures to strengthen placemaking and neighborhood identity.

SS 7.1 Incorporate artistic or cultural detailing inspired by Sonoran Desert forms or the distinct character of Scottsdale's built and natural environments.

SS 7.2 Coordinate with Scottsdale Public Art or other community partners when designing large or iconic structures in civic spaces.

SS 7.3 Design structures to act as landmarks or wayfinding cues, aiding pedestrian orientation and highlighting key destinations.



SkySong shade structures strengthen area identity while providing filtered shade.

SS 7.4 Use lighting and signage integration to enhance visibility, orientation, and safety.

SS 7.5 In historic or design-sensitive areas, use materials, finishes, colors and detailing that are visually compatible with the surrounding architecture and landscape.

SS 8 Promote universal access and comfort for all users.

SS 8.1 Comply with ADA standards for clear width, head clearance, and maneuvering space beneath and around structures.

SS 8.2 Provide shade near amenities such as benches, transit stops, and play areas.

SS 8.3 Maintain visual openness (minimum 60% transparency for vertical elements) to ensure safety and natural surveillance.

Transit stop provides vertical and horizontal shade.

SS 8.4 Design shade structures to maintain horizontal airflow and avoid heat buildup.

SS 8.4.1 Provide openings along at least two sides of the structure.

SS 8.4.2 Avoid fully enclosed or low-clearance designs that trap heat.

SS 8.5 Incorporate cool-surface materials and airflow openings to maintain thermal comfort.

MATERIALS & MAINTENANCE

Select durable, climate-appropriate materials and establish proactive maintenance strategies to ensure long-term performance, safety, and visual quality.

SS 9 Select materials that perform well in Scottsdale's desert climate.

SS 9.1 Use UV-resistant metals, treated woods, masonry, or high-performance composites that can withstand temperature extremes, sun exposure, and seasonal weather variations.

SS 9.2 Apply powder-coated or corrosion-resistant finishes on metal elements to prevent rust and color fading.

SS 9.3 Avoid materials prone to warping, brittleness, or delamination under prolonged heat.

SS 9.4 Design with materials that maintain appearance and function without frequent replacement or refinishing.

Material Selection for Desert Performance

Scottsdale's desert climate presents unique challenges for shade structures: prolonged UV exposure, high summer heat, and monsoonal weather swings. The materials selected must balance durability, maintenance, and thermal comfort.

LEGEND — Durability (D), Maintenance (M), Heat Retention (H) | ○ Low ◎ Moderate ● High

Metal

D M H ● ○ ○

Long-life choice for civic and commercial spaces. Use high-performance powder-coated finishes, paired with light colors to reduce surface heat, extend lifespan and reduce maintenance.

Solar Panel

D M H ● ○ ○

Long-term, dual-purpose shade and energy generation for parking or transit sites. Requires yearly cleaning to remove debris that can block sunlight and reduce efficiency.

Wood

D M H ○ ○ ○

Commonly used for pergolas and open-air structures, offering a natural aesthetic that blends well with green spaces. Requires regular maintenance to prevent deterioration.

Fabric

D M H ○ ● ○

Lightweight and flexible for play areas or plazas. Select UV-stable, PVC- or PTFE-coated fabrics with high tear strength. Attachment points should be inspected annually.

Figure 3-5. Shade structure material selection.

SS 10 Align material selection with the intended function and context of the site.

SS 10.1 Use tensile fabric or open-air pergolas for flexible recreation areas, fixed metal or solar canopies for parking and high-use civic spaces, and artistic or sculptural forms for signature public areas.

SS 10.2 Use durable materials such as steel, masonry, or concrete for civic plazas, parking areas, and other high-use spaces.

SS 10.3 In neighborhood or park settings, apply wood, fabric, or hybrid systems that convey warmth and scale appropriate to the context.

Flat roof covered walkway is constructed of wood to reinforce the pedestrian character of Old Town.

SS 10.4 For artful or signature projects, combine sculptural forms, artistic detailing, or cultural motifs.

SS 11 Integrate water efficiency and renewable energy performance into shade structures.

SS 11.1 Where feasible, integrate solar panels or other renewable energy components within shade structures, particularly in parking areas, civic facilities, or commercial properties.

SS 11.2 Design drainage and gutter systems to direct runoff into landscape basins or bioswales, supporting water harvesting and plant irrigation.

SS 12 Select materials that maintain performance and mitigate heat buildup in extreme temperatures.

SS 12.1 For materials regularly touched by users (handrails, seating, support columns), select finishes that demonstrate “safe-to-touch” surface temperatures at or below approximately 140°F during peak summer conditions.

SS 12.2 Prioritize lighter colors, cool-surface coatings, and heat-reflective finishes for metal components to reduce radiant temperatures beneath the structure.

SS 12.3 Avoid dark or high-absorptance materials.

SS 13 Design structures for Scottsdale wind and monsoon conditions.

SS 13.1 Shade structures must be designed to withstand regional high-wind events and monsoon gusts, following certified structural engineering calculations.

SS 13.2 Fabric structures should include engineered tension systems and reinforced anchor points. Redundancy connections are required for structures located in public spaces.

SS 14 Develop a proactive maintenance plan.

SS 14.1 Inspect structures annually for corrosion, loose fasteners, fading, or material deterioration.

SS 14.2 Coordinate maintenance activities with tree pruning and irrigation inspections.

Annual Structural Inspection Checklist

- **Fasteners**: corrosion, loosening,
- **Coatings & finishes**: fading, chalking, peeling, rust
- **Footings & foundations**: cracking, settlement
- **Fabric tensioning systems**: sagging, UV damage, weakened anchor points
- **Cables & turnbuckles**: rust, slack
- **Drainage systems**: clogs, sediment buildup, improper outflow
- **Solar panels**: annual cleaning to remove dust; mounting integrity and wiring
- **Lighting**: housings, gaskets, brittle wiring

Post-Monsoon Evaluation

- Inspect canopies for wind damage
- Check all bolts for uplift stress
- Confirm that fabric or metal systems have not warped or loosened

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DESIGN SCENARIOS

~~This section uses graphics to highlight shade infrastructure in use. Use the numbered site notes and lettered tree callouts to find related guidance in the Tree Guidelines, Recommended Tree List, Water Harvesting Guidelines, and Shade Structure Guidelines.~~

DESIGN SCENARIOS TRANSLATE THE GUIDELINES INTO APPLIED EXAMPLES THAT ILLUSTRATE HOW TREES, WATER HARVESTING, AND SHADE STRUCTURES WORK TOGETHER IN REAL-WORLD SITE CONDITIONS. USING ANNOTATED GRAPHICS, THIS SECTION DEMONSTRATES HOW SHADE INFRASTRUCTURE CAN BE CONFIGURED ACROSS A RANGE OF TYPICAL DEVELOPMENT CONTEXTS. RATHER THAN PRESCRIBING FIXED SOLUTIONS, THE DESIGN SCENARIOS PROVIDE ADAPTABLE APPROACHES THAT RESPOND TO SITE-SPECIFIC CONDITIONS WHILE REINFORCING THE OVERARCHING GOALS OF SHADE PROVISION, WATER EFFICIENCY, AND LONG-TERM PERFORMANCE. TOGETHER, THEY PROVIDE A VISUAL FRAMEWORK FOR UNDERSTANDING HOW SCOTTSDALE'S SHADE INFRASTRUCTURE STRATEGIES CAN BE IMPLEMENTED.

Site Notes / Considerations

Notes highlight design specifics and where to find related items in the plan.

1. **Tree Selection**
   - References the Site Specific Tree Lists and Guides (see pages 38 - 47)
2. **Water Harvesting**
   - References Water Harvesting systems (see pages 66 - 75)
3. **Soil Volumes**
   - References recommended Soil Volumes (see pages 34 - 35)
4. **Pedestrian Focus**
   - How to provide shade to maximize pedestrian benefits
5. **Best Practice**
   - Site-specific notes and recommendations for the space

A - B - C - D / Tree Guides

Refer to Tree Guides for detailed species attributes that inform tree selection and management.

- **A** Hardscape Buffers
- **B** Planter Dimension
- **C** Distance Between Trees
- **D** Building Distance

YELLOW BIRD OF PARADISE

Caesalpinia mexicana

Ⓑ	Size(hxw)	10' x 10'
	Growth Rate	fast
	Shade Type	medium
	Deciduous	no, evergreen
	Flower	yes, summer
	Fruit	no
	Water	lower
	Litter	medium
	Thorns	no
	Poisonous	no
	Pool-friendly	yes
Ⓒ	Distance Apart	8' O.C.
Ⓐ	Min Sidewalk Dist.	4'
Ⓐ	Min Street Dist.	8'
Ⓓ	Min Building Dist.	4'
	Parking Lot	no
	Utility Notes	-

Figure 4-1. Building frontage with onstreet angled parking.

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, NEAR BUILDING - Broad, overhead canopy with adequate clearance
2. WATER HARVESTING ELEMENT - Curb cut, bioswale, suspended pavement
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with suspended pavement
4. PEDESTRIAN FOCUS - Trees shade the primary sidewalk and building entrances
5. BEST PRACTICE - Combine tree, structured shade to maximize shade coverage

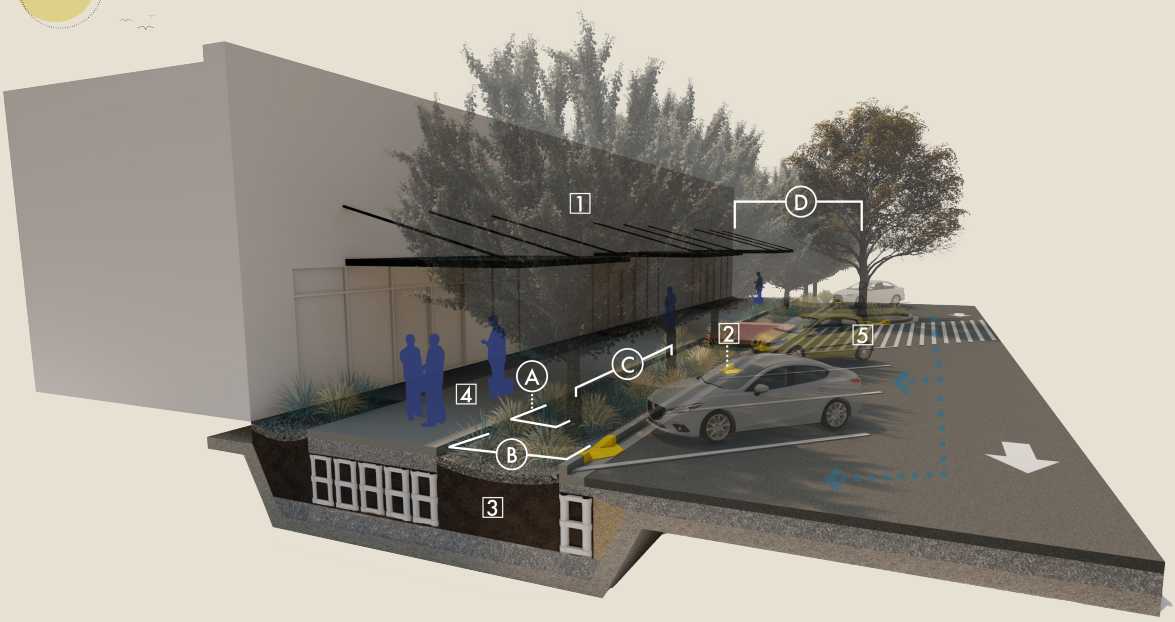

Figure 4-2. Building frontage with on-street parallel parking.

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, NEAR BUILDING - Broad, overhead canopy with adequate clearance
2. WATER HARVESTING ELEMENT - Permeable pavement, curb cut, pedestrian bridge
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with structural soil
4. PEDESTRIAN FOCUS - Prioritize shade where people exit vehicles
5. BEST PRACTICE - Use continuous planting strips and structural soil beneath pedestrian and parking areas to expand shared rooting volume

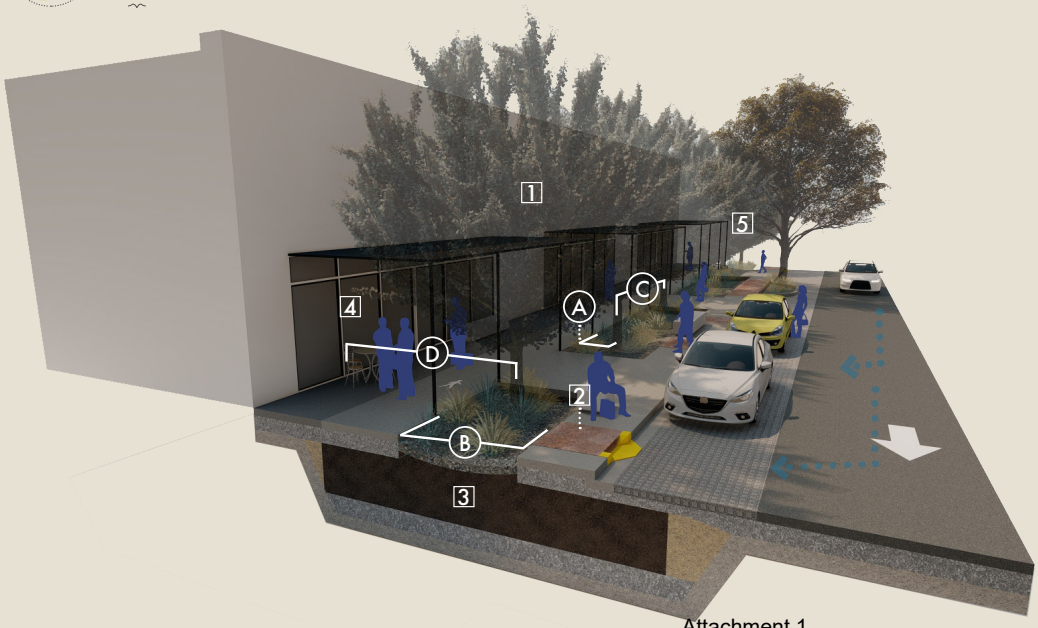

Figure 4-3. Building frontage and parking parking lot.

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, PARKING LOTS - Broad canopy with adequate clearance and minimal litter
2. WATER HARVESTING ELEMENT - Curb cut, bioswale, rain garden, suspended pavement
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with suspended pavement
4. PEDESTRIAN FOCUS - Trees shade the primary sidewalk and building entrances
5. BEST PRACTICE - Combine tree, structured shade to maximize shade coverage

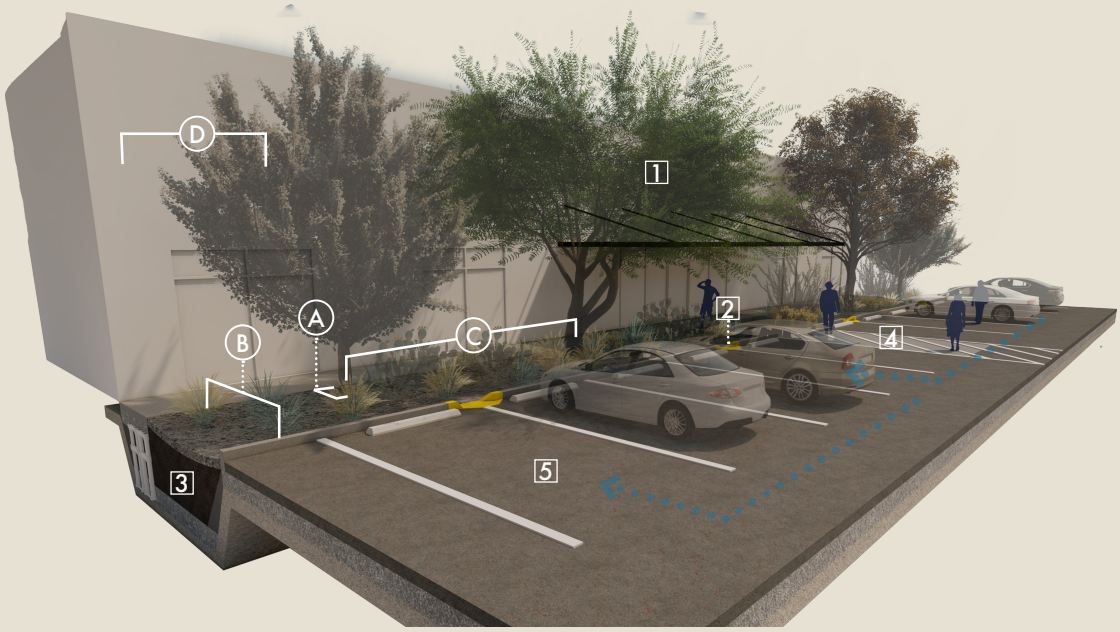

Figure 4-4. Pedestrian path.

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, PATH/SIDEWALKS - Broad, overhead canopy with adequate clearance
2. WATER HARVESTING ELEMENT - Bioswale, suspended pavement
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with suspended pavement
4. PEDESTRIAN FOCUS - Prioritize shade where people exit vehicles
5. BEST PRACTICE - Avoid planting trees in lawn areas. Sprinkler irrigation discourages deep root growth

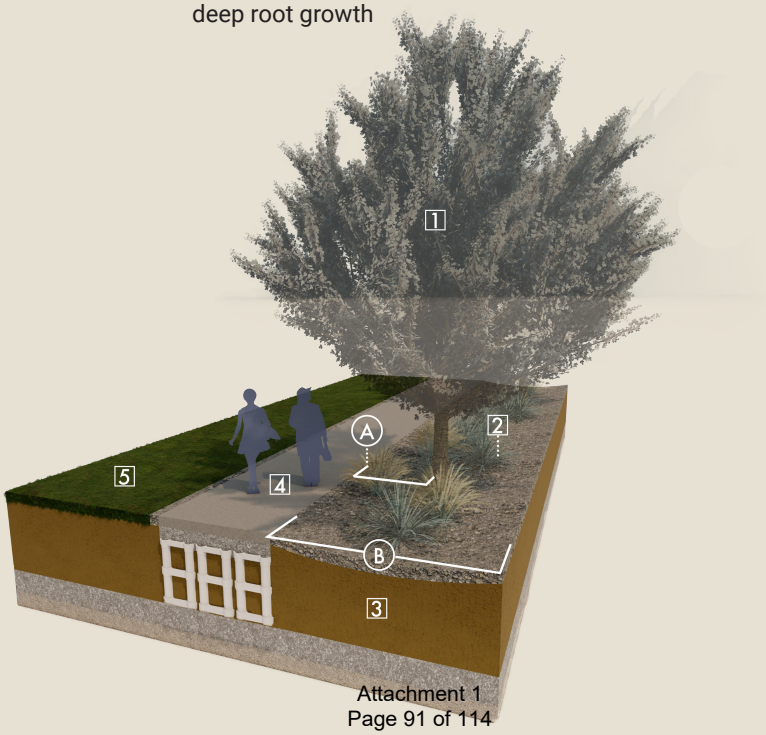

Figure 4-5. Roadway trees back of curb.

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, STREET, BACK OF CURB - Prioritize clearance above travel lanes and signage
2. WATER HARVESTING ELEMENT - Curb cut, bioswale, suspended pavement
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with suspended pavement
4. PEDESTRIAN FOCUS - Seperate pedestrian areas from vehicular traffic
5. BEST PRACTICE - Use continuous planting strips, furnishings, or low edges to reinforce the separation from traffic while maintaining clear sightlines at driveways and intersections

Figure 4-6. Roadway trees separated by pedestrian path

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, STREET, BACK OF SIDEWALK - Larger trees in wide, back-of-sidewalk planter
2. WATER HARVESTING ELEMENT - Curb cut, bioswale, rain garden, suspended pavement
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with suspended pavement
4. PEDESTRIAN FOCUS - Pedestrian shade prioritized by tree location
5. BEST PRACTICE - Use continuous planting strips, furnishings, or low edges to reinforce the separation from traffic

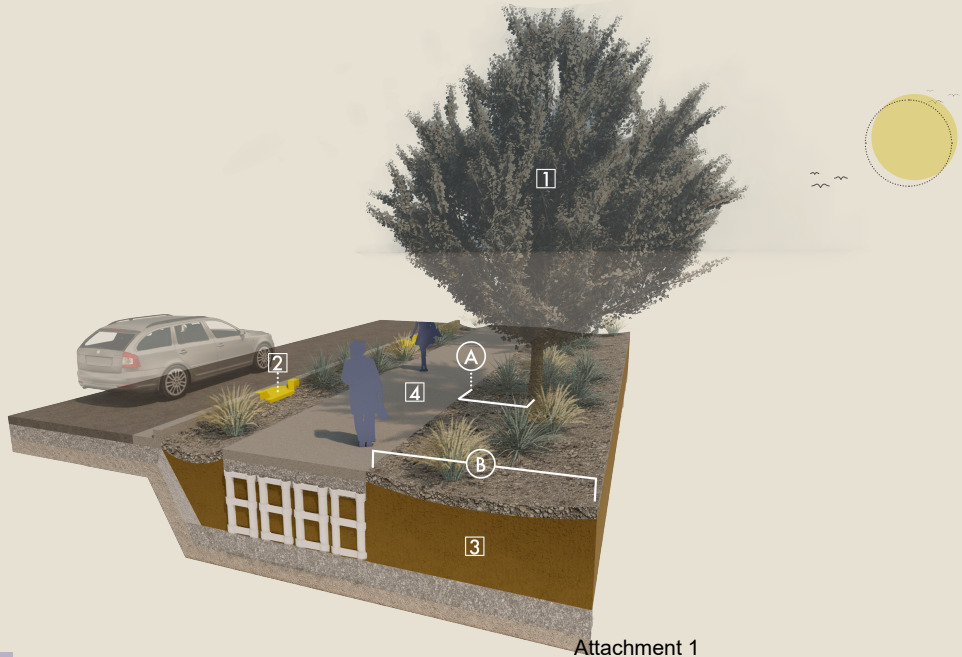

Figure 4-7. Pedestrian trail.

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, PATH/SIDEWALKS - Broad, overhead canopy with adequate clearance
2. WATER HARVESTING ELEMENT - Bioswale, rain garden, suspended pavement
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with suspended pavement
4. PEDESTRIAN FOCUS - Continuous shade along high-use trail segments, at rest areas
5. BEST PRACTICE - Use low, desert-adaptive understory plantings that preserve sight lines

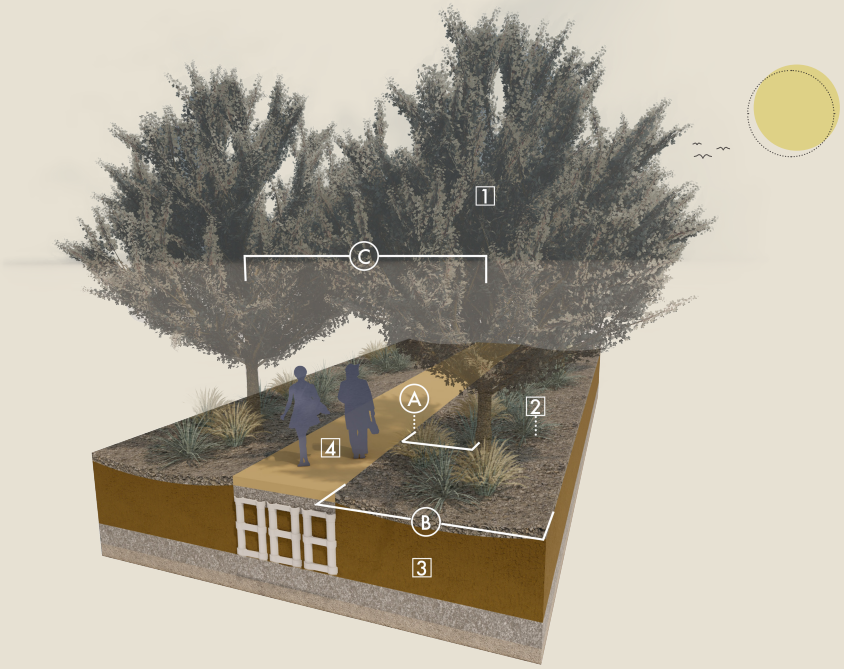

Figure 4-8. Pedestrian path adjacent to roadway and utilities.

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, STREET, BACK OF CURB - Prioritize clearance above travel lanes and signage
2. WATER HARVESTING ELEMENT - Curb cut, bioswale, suspended pavement
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with suspended pavement
4. PEDESTRIAN FOCUS - Prioritize pedestrian shade while keeping clear of utilities
5. BEST PRACTICE - Coordinate tree placement with utility providers; maintain recommended clearances from boxes, vaults, and poles

Figure 4-9. Parking near a pedestrian path.

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, PARKING LOTS - Broad canopy with adequate clearance and minimal litter
2. WATER HARVESTING ELEMENT - Bioswale, rain garden, suspended pavement
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with suspended pavement
4. PEDESTRIAN FOCUS - Trees shade walking routes, access points, and seating areas
5. BEST PRACTICE - Use the outer planting strip to frame the path and complete a continuous shaded edge

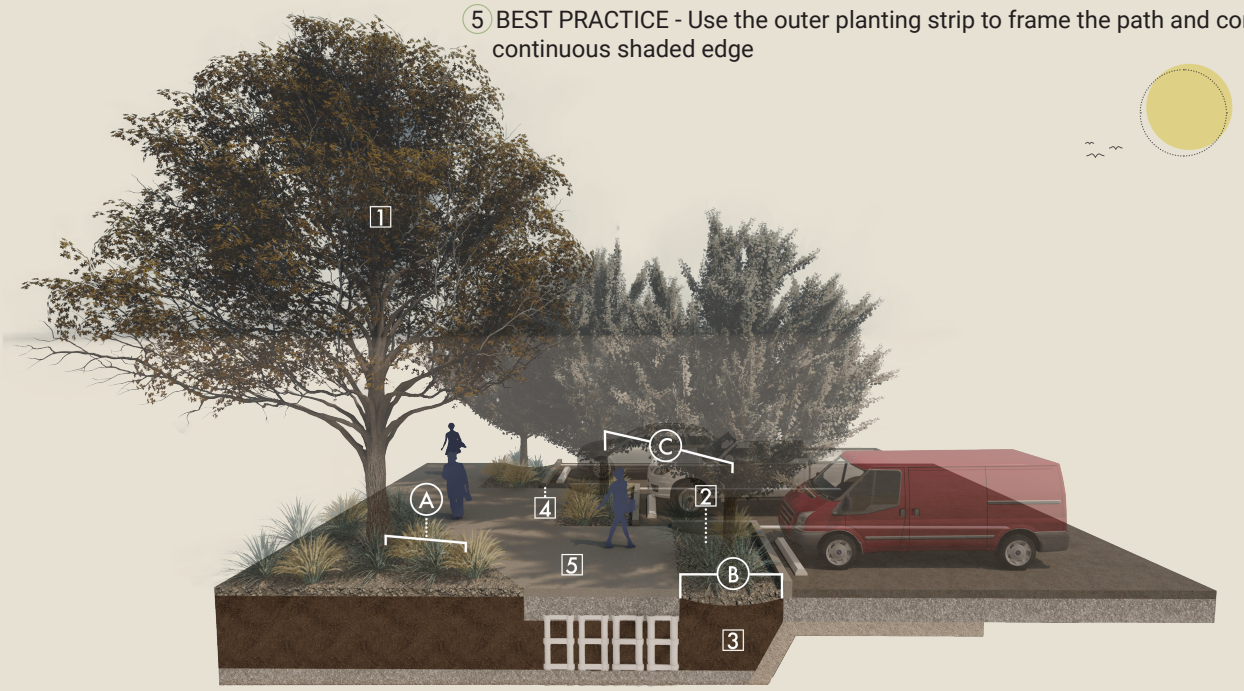

Figure 4-10. Planter in a parking area.

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, PARKING LOTS - Broad canopy with adequate clearance and minimal litter
2. WATER HARVESTING ELEMENT - Curb cut, bioswale, structural soil
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with structural soil
4. PEDESTRIAN FOCUS - Prioritize shade where people exit vehicles
5. BEST PRACTICE - Use continuous planting strips and structural soil to link individual islands where possible

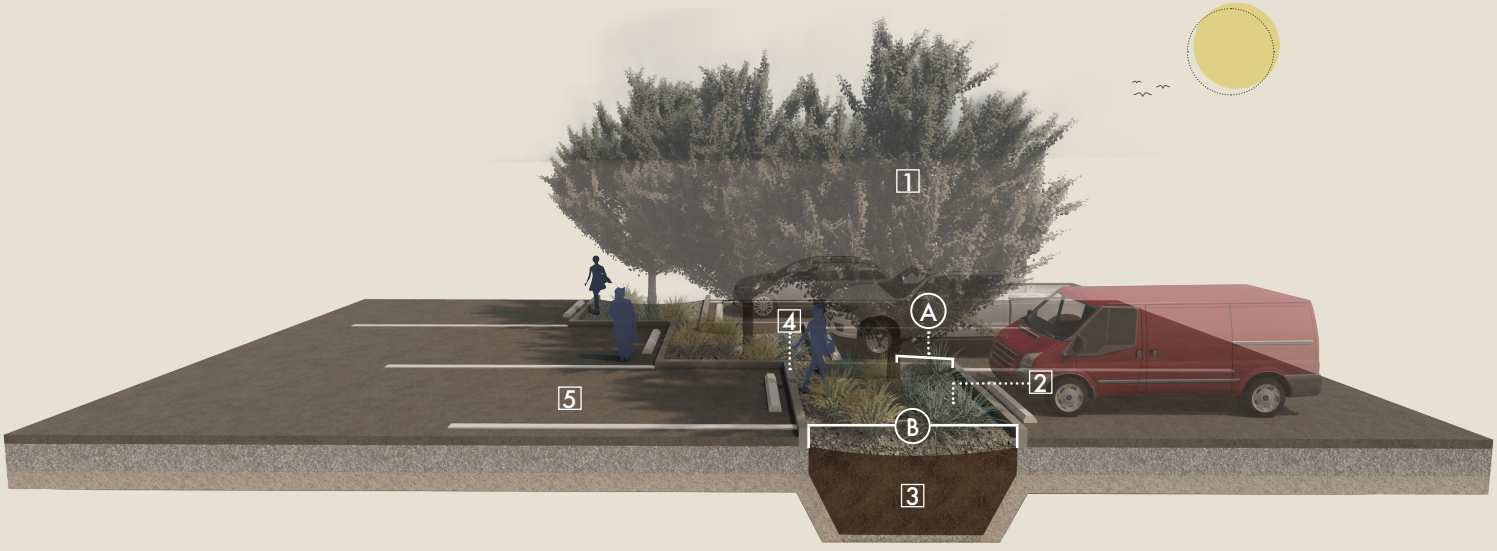

Figure 4-11. Parking dogbone.

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, PARKING LOTS - Broad canopy with adequate clearance and minimal litter
2. WATER HARVESTING ELEMENT - Curb cut, bioswale, rain garden, structural soil
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with structural soil
4. PEDESTRIAN FOCUS - Prioritize shade where people exit vehicles
5. BEST PRACTICE - Place dogbone islands at regular intervals to break up long rows of parkingand form a continuous shaded spine

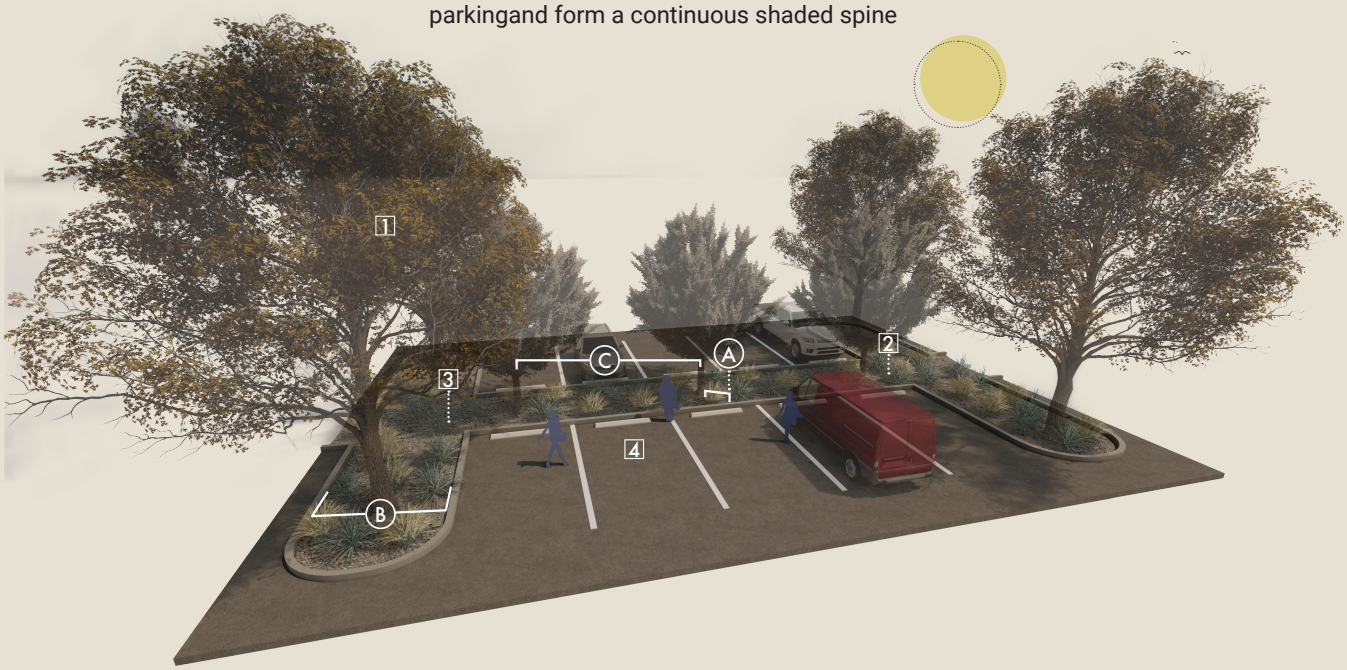

Figure 4-12. Planter islands in a parking area.

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, PARKING LOTS - Broad canopy with adequate clearance and minimal litter
2. WATER HARVESTING ELEMENT - Bioswale, suspended pavement
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with suspended pavement
4. PEDESTRIAN FOCUS - Prioritize shade where people exit vehicles and pedestrian paths
5. BEST PRACTICE - Space planter islands so no stall is far from a tree, creating a more continuous canopy along parking rows

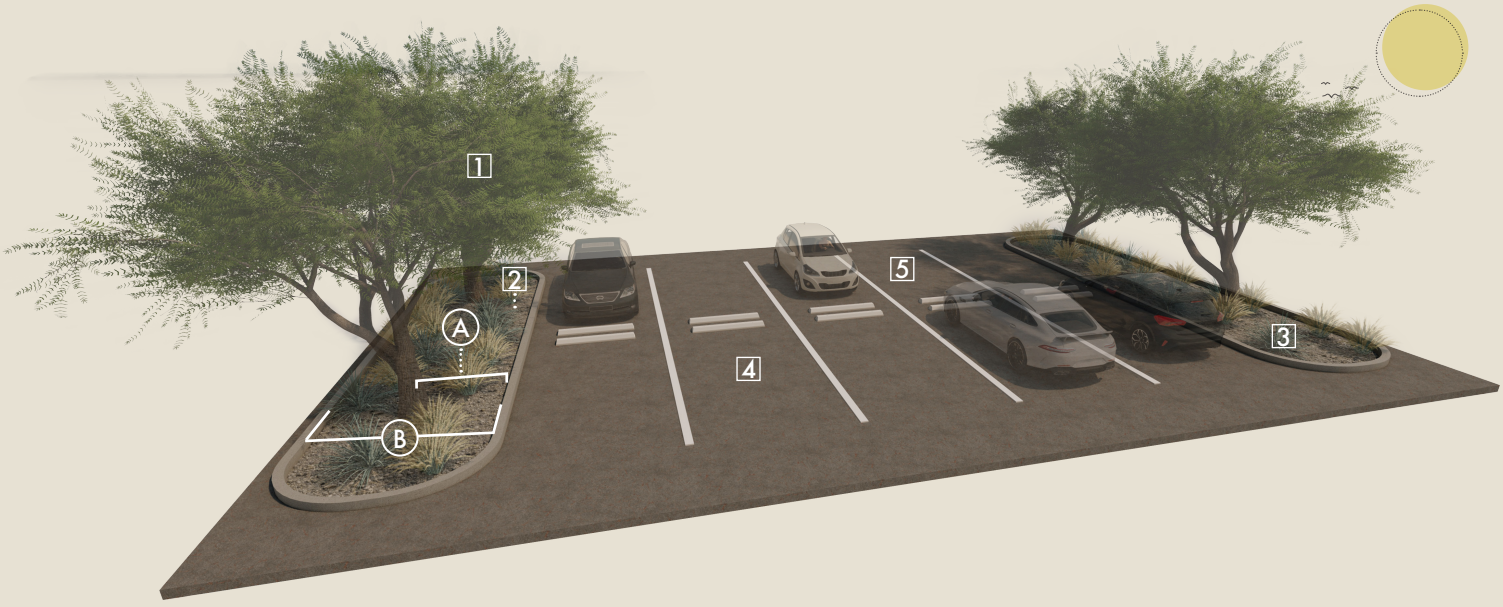

Figure 4-13. Parking with alternating planter islands

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, PARKING LOTS - Broad canopy with adequate clearance and minimal litter
2. WATER HARVESTING ELEMENT - Curb cut, bioswale, suspended pavement
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with suspended pavement
4. PEDESTRIAN FOCUS - Locate trees to shade typical walking routes between parked cars
5. BEST PRACTICE - Stagger planter islands so trees alternate from side to side, creating overlapping canopies and reducing unshaded gaps along the parking rows

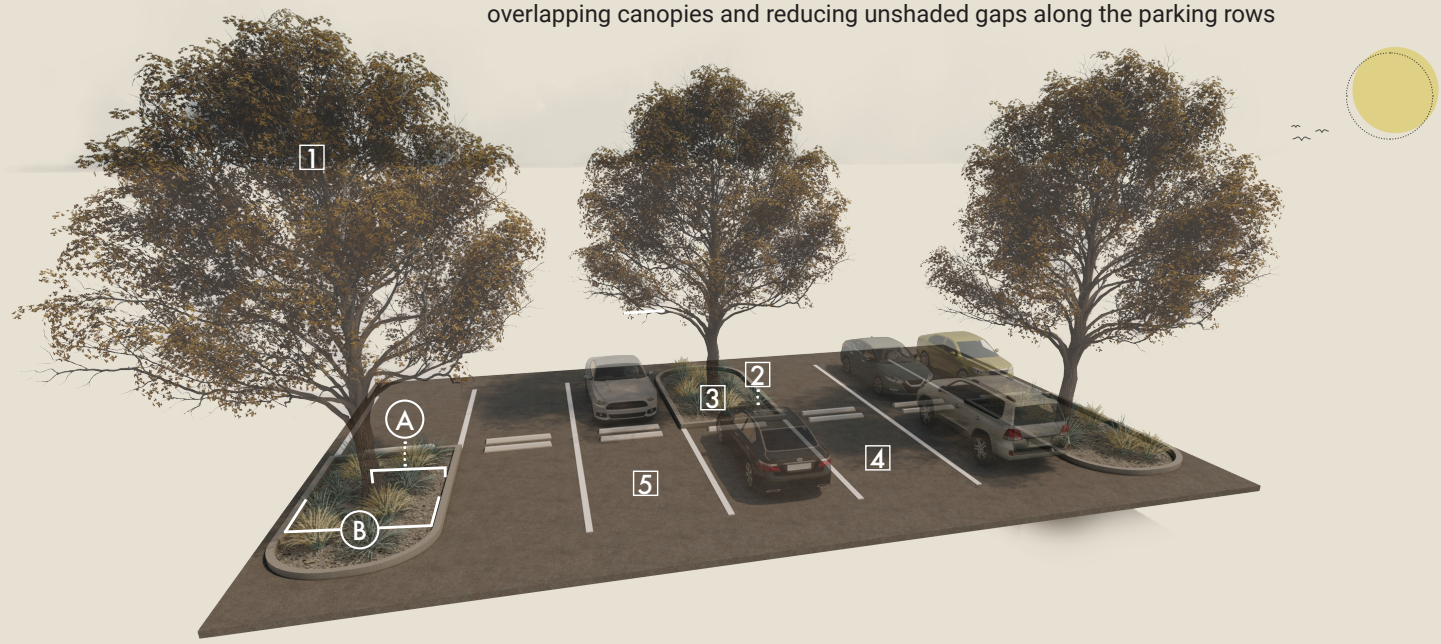

Figure 4-14. Gathering spaces and playgrounds.

TREE GUIDE FOR SPECIFICS ON:

- A HARDSCAPE BUFFERS
- B PLANTER DIMENSION
- C DISTANCE BETWEEN TREES
- D BUILDING DISTANCE

SITE NOTES:

1. TREE GUIDE, LARGE TREES - Broad canopy, non-thorny trees shade seating and playground
2. WATER HARVESTING ELEMENT - Bioswalk, rain garden suspended pavement
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with suspended pavement
4. PEDESTRIAN FOCUS - Prioritize shade along paths, seating areas, and near play equipment
5. BEST PRACTICE - Combine shade structures with trees to provide reliable overhead coverage while extending shade beyond the play area, cooling surrounding hardscape, and offering long-term canopy

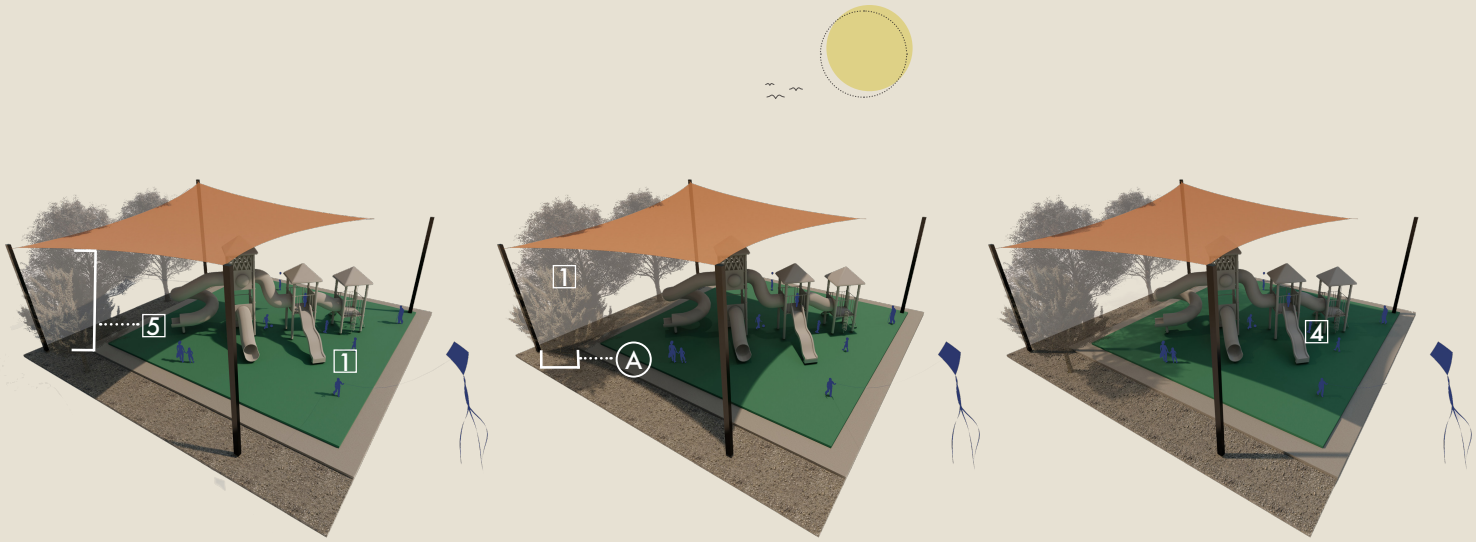

Figure 4-15. Shade structures and trees.

TREE GUIDE FOR SPECIFICS ON:

- (A) HARDSCAPE BUFFERS
- (B) PLANTER DIMENSION
- (C) DISTANCE BETWEEN TREES
- (D) BUILDING DISTANCE

SITE NOTES:

1. TREE GUIDE, LARGE TREES - Broad canopy, non-thorny trees shade seating areas
2. WATER HARVESTING ELEMENT - Rain garden, basin, structural soil
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with structural soil
4. PEDESTRIAN FOCUS - Align trees to shade approach paths, gathering zones
5. BEST PRACTICE - Coordinate tree spacing, column layout, and roof overhangs so tree canopy and structure work together: structures supply reliable core shade, and trees extend shade into surrounding pavement

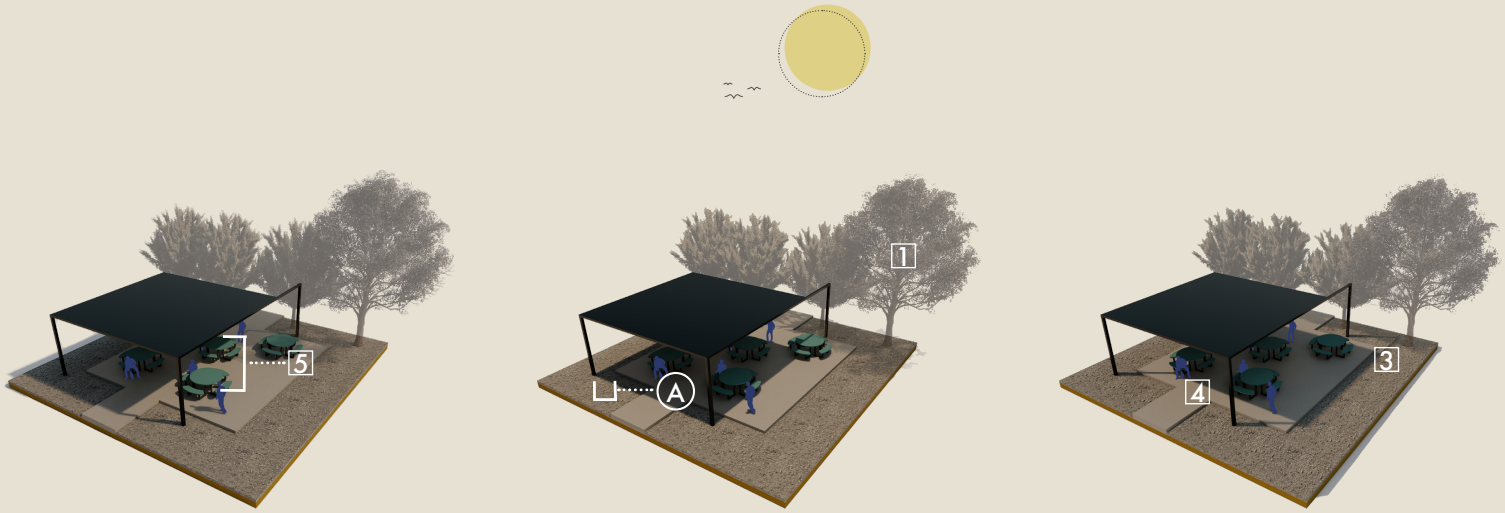

Figure 4-16. Shade structures or trees.

TREE GUIDE FOR SPECIFICS ON:

- (A) HARDSCAPE BUFFERS
- (B) PLANTER DIMENSION
- (C) DISTANCE BETWEEN TREES
- (D) BUILDING DISTANCE

SITE NOTES:

1. TREE LIST, STREET, BACK OF CURB - Prioritize clearance above travel lanes and signage
2. WATER HARVESTING ELEMENT - Curb cut, bioswale, structural soil
3. SOIL VOLUMES - 500 cu ft Min., 1,000 cu ft with structural soil
4. PEDESTRIAN FOCUS - Align trees or structures so shade falls along pedestrian route
5. BEST PRACTICE - Use trees as the preferred long-term shade solution wherever adequate width, soil volume, and utility clearances exist, and rely on shade structures in street locations where utilities, hardscape constraints, or limited planting space make tree installation impractical

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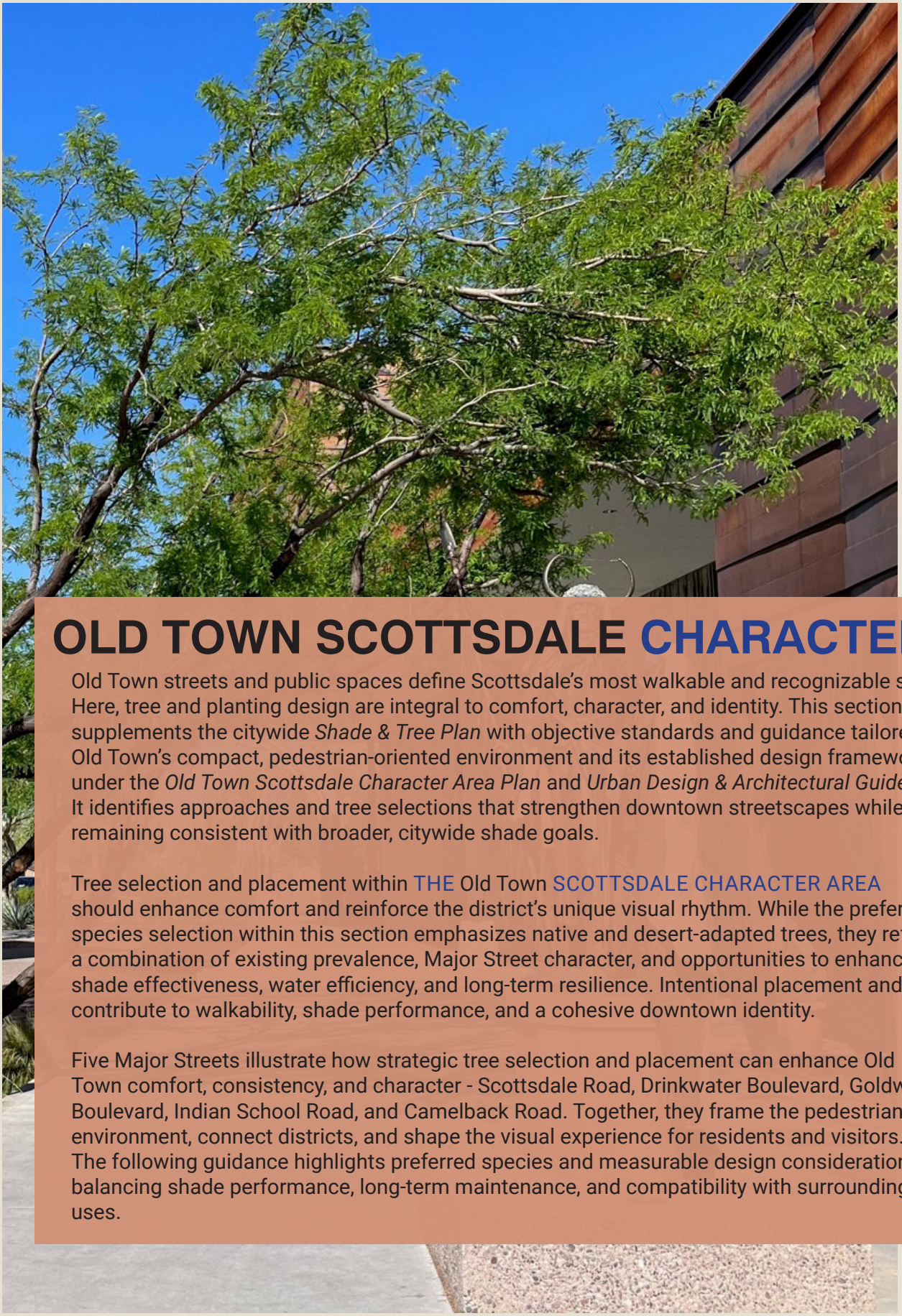


OLD TOWN SCOTTSDALE CHARACTER AREA

Old Town streets and public spaces define Scottsdale's most walkable and recognizable setting. Here, tree and planting design are integral to comfort, character, and identity. This section supplements the citywide *Shade & Tree Plan* with objective standards and guidance tailored to Old Town's compact, pedestrian-oriented environment and its established design framework under the *Old Town Scottsdale Character Area Plan* and *Urban Design & Architectural Guidelines*. It identifies approaches and tree selections that strengthen downtown streetscapes while remaining consistent with broader, citywide shade goals.

Tree selection and placement within THE Old Town SCOTTSDALE CHARACTER AREA should enhance comfort and reinforce the district's unique visual rhythm. While the preferred species selection within this section emphasizes native and desert-adapted trees, they reflect a combination of existing prevalence, Major Street character, and opportunities to enhance shade effectiveness, water efficiency, and long-term resilience. Intentional placement and form contribute to walkability, shade performance, and a cohesive downtown identity.

Five Major Streets illustrate how strategic tree selection and placement can enhance Old Town comfort, consistency, and character - Scottsdale Road, Drinkwater Boulevard, Goldwater Boulevard, Indian School Road, and Camelback Road. Together, they frame the pedestrian environment, connect districts, and shape the visual experience for residents and visitors. The following guidance highlights preferred species and measurable design considerations, balancing shade performance, long-term maintenance, and compatibility with surrounding land uses.

Design and Implementation Framework

Although all Citywide Guidelines apply in Old Town, the accompanying Old Town Scottsdale CHARACTER AREA Tree Guidelines, Major Streets Map (see page 102), and Street Tree Palette (see page 103) provide additional clear, measurable direction for Scottsdale's downtown area. The map identifies Scottsdale Road, Drinkwater Boulevard, Goldwater Boulevard, Indian School Road, and Camelback Road as Major Streets, each with corresponding Tree Palette and standards specifying Theme and Accent species, recommended spacing intervals, and preferred canopy forms designed to maintain rhythm, shade effectiveness, and visual consistency along each corridor. These standards ensure that new improvements, replacements, or infill plantings remain compatible with established canopy patterns and continue to advance citywide shade coverage objectives.

While the Street Tree Palette provides street-specific direction for Major Streets, the Old Town Scottsdale CHARACTER AREA Tree Guidelines apply more broadly, offering principles for tree placement, health, and maintenance throughout the Old Town network of streets, plazas, and pedestrian connections. These guidelines establish the technical foundation for achieving consistent, high-performance shade and landscape outcomes across varying contexts.

Tree Selection & Location defines how trees should be placed to reinforce streetscape rhythm, complement adjacent architecture, and meet minimum spacing and setback standards. It introduces objective standards for consistency, visibility, and coordination with utilities.

Trees in Parking Areas extends these principles into surface parking areas, specifying shade coverage requirements to achieve 50% surface shade at maturity.

Together, these components create a complete decision-making framework, from planning and design to construction and long-term management. The map and street prescriptions illustrate where each tree type should occur, while the guidelines describe how those trees should be planted, sustained, and integrated with the surrounding built form. When used collectively, they ensure that tree selection, placement, and performance advance consistent, measurable outcomes for shade and identity across Scottsdale's downtown.

Shaded pedestrian path along Arizona Canal.

Legacy + Character

The Street Tree Palette balances shade performance with established landscape character. Sissoo remains the theme tree on Indian School Road because an existing mature canopy defines the corridor and continues to provide meaningful shade. Date Palms and Mexican Fan Palms are included as accent trees in select segments where they are strongly associated with Old Town's resort-style and historic identity. Where these species provide limited shade or present maintenance considerations, they should be used strategically and paired with higher-performing shade trees to maintain corridor shade objectives.

TREE SELECTION & LOCATION

Ensure tree placement provides measurable pedestrian shade, visual continuity, and compatibility with adjacent development.

OT 1 Trees should be located within rights-of-way, open space, and landscape areas to provide pedestrian shade, reinforce designated street theme palettes, and establish a continuous streetscape rhythm through species selection, canopy form, and spacing.

OT 1.1 Old Town Scottsdale CHARACTER AREA Major Streets should incorporate designated Theme and Accent trees per adopted palette and spacing (see pages 102 - 103).

- OT 1.1.1 Theme tree spacing may only be adjusted for driveways, utilities, or visibility triangles.
- OT 1.1.2 Accent trees may be located near entries, intersections, or courtyards to create visual focus within the rhythm of theme trees.

OT 1.2 Old Town Scottsdale CHARACTER AREA streets where no adopted palette exists, should incorporate tree species that match the prevailing species present along the same street frontage.

- OT 1.2.1 Tree spacing should match mature canopy width, unless constrained by driveways, utilities, or visibility triangles.

OT 1.3 Streetscape design should respond to roadway function and adjacent land-use context while maintaining consistent shade rhythm.

OT 1.4 Taller accent trees may be used to reduce perceived street width and soften adjacent building massing.

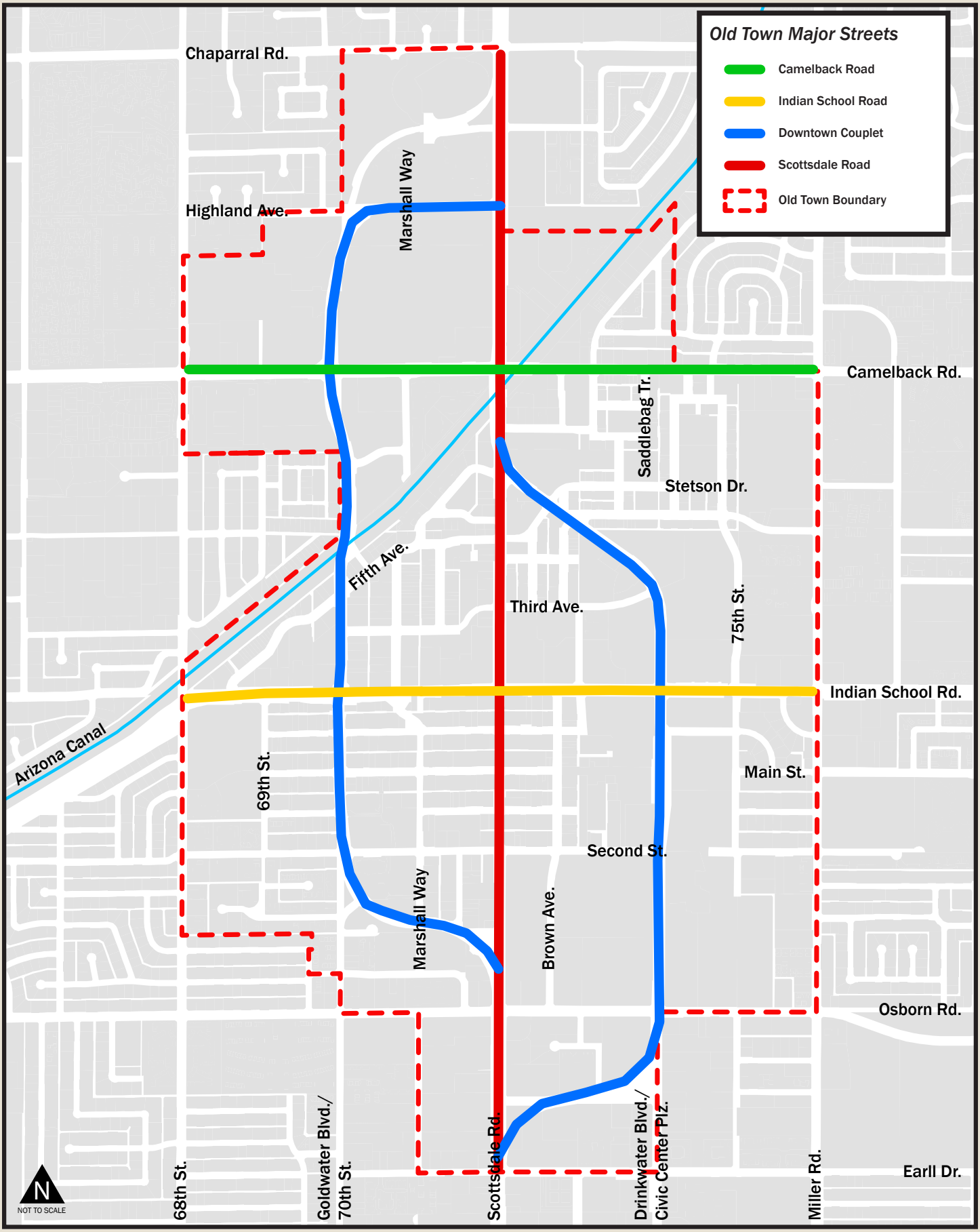
OT 1.5 Open space areas greater than 2,500 square feet should include trees at a rate of one tree per 500 square feet of landscape area.

OT 1.6 Trees in open spaces should be placed in linear, geometric, or clustered groupings to define pedestrian linkages and gathering areas.

OT 1.7 Plantings of three or more trees of a like species should be grouped in odd numbers and used to define activity areas and provide visual cohesion.

OT 1.8 Avoid placing fruiting species or trees prone to heavy bird nesting adjacent to pedestrian areas.

Old Town Scottsdale CHARACTER AREA Major Streets



Notice: This document is provided for general information purposes only. The City of Scottsdale does not warrant its accuracy, completeness, or suitability for any particular purpose. It should not be relied upon without field verification. Map not to scale.

CAMELBACK ROAD

Camelback Road is divided into two design segments based on adjacent land uses and existing planting patterns. Segment 1 reflects larger-scale mixed-use and resort development. Segment 2 transitions to smaller-scale commercial, hotel, and service-residential uses, with a corresponding shift in the tree palette:

Camelback Road Segment 1 – 68th Street to Saddlebag Trail
Theme Tree: Live Oak (25-30 ft spacing)
Accent Tree, Street Frontage: Date Palm (15-20 ft spacing)
Accent Tree, Medians: Sonoran Emerald Palo Verde (25-30 ft spacing)

Camelback Road Segment 2– Saddlebag Trail to Miller Road
Theme Tree: Evergreen Elm (25-30 ft spacing)
Accent Tree, North-side Street Frontage: Texas Ebony (25-30 ft spacing)
Accent Tree, South-side Street Frontage: Date Palms (15-20 ft spacing)

INDIAN SCHOOL ROAD

Indian School Road is the primary east–west access into Old Town and connects to multiple Old Town Districts. This roadway is defined by wider setbacks with separated sidewalks, plazas, and coordinated landscaping, further supported by a consistent double-row street tree pattern:

Indian School Road
Theme Tree: Sissoo (30–35’ spacing)
Accent Tree, street frontage: Pistache Red Push (located at intersections, 25–30’ spacing)
Accent Tree, medians: Texas Ebony (25–30’ spacing)

DOWNTOWN COUPLET

Drinkwater and Goldwater Boulevards form a north–south couplet east and west of Scottsdale Road, serving the majority of Old Town Districts. Each roadway has five travel lanes and a landscaped median, providing circulation around the Downtown Core and access to civic, parking, and mixed-use destinations. The Downtown Couplet is intended to function as a pair of civic boulevards:

Drinkwater Boulevard
Theme Tree: Pistache Red Push (25–30’ spacing)
Accent Tree, street frontage: Fruitless Olive (15–20’ spacing)
Accent Tree, intersections, driveway entrances, and plaza spaces: Date Palm (15–20’ spacing)
Accent Trees, medians: Alternating Fruitless Olive (15–20’ spacing) and Date Palm (15–20’ spacing)

Goldwater Boulevard
Theme Tree: Ironwood (25–30’ spacing)
Accent Tree, intersections and curb cuts north of Indian School Road: Date Palm (15–20’ spacing)
Accent Tree, street frontage south of Indian School Road: Date Palm (15–20’ spacing)
Accent Tree, medians: Ghost Gum (30–50’ spacing)

SCOTTSDALE ROAD

Scottsdale Road is the central north–south spine through Old Town, serving the majority of Old Town Districts and providing access to a wide range of land uses and building scales. Through-traffic is redirected to the Downtown Couplet, allowing Scottsdale Road to function as a primary urban corridor. For design purposes, Scottsdale Road includes endcap, gateways:

Scottsdale Road Gateways – Chaparral Road to Camelback Road & 2nd Street to Earll Drive
Theme Tree: Live Oak (25–30’ spacing)
Accent Trees, street frontage: Date Palm (15–20’ spacing) and Sweet Acacia (20’ spacing)
Accent Tree, medians: Sweet Acacia (20’ spacing)

Scottsdale Road – Camelback Road to 2nd Street
Theme Tree: Live Oak (25–30’ spacing)
Accent Tree, in clusters at street frontage: Mexican Fan Palm (5–10’ spacing)
Accent Tree, medians: Sweet Acacia (20’ spacing)
Accent Tree, in clusters within medians: Mexican Fan Palm (5–10’ spacing)

TREES IN PARKING AREAS

Reduce heat gain and improve comfort in surface parking areas through consistent canopy coverage.

OT 2 Shade trees should be provided within surface parking lots to achieve consistent canopy coverage and complement other shade systems.

OT 2.1 Trees should be set back a minimum of 2 feet from curbs or parking stall edges to allow vehicle door swing and bumper overhang.

OT 2.2 Tree species used in parking areas should be single trunk, maintain minimum clearance of 7 feet above parked vehicles, and have limited fruit or sap.

OT 2.3 Canopy trees should be provided in required landscape islands at intervals sufficient to achieve 50% surface shade coverage based on projected canopy spread at species maturity.

Consistent canopy coverage in parking areas can reduce heat gain.

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APPENDIX

GLOSSARY

#

30/20/10 RULE – A PLANTING GUIDELINE USED TO PROMOTE BIODIVERSITY AND REDUCE RISKS ASSOCIATED WITH MONOCULTURES BY LIMITING PLANT COMPOSITION TO NO MORE THAN 30% FROM A SINGLE FAMILY, 20% FROM A SINGLE GENUS, AND 10% FROM A SINGLE SPECIES WITHIN A LANDSCAPE.

A

Active Water Harvesting – Systems that collect rainwater and store it for later use, such as cisterns or gray water systems.

Air Spade – A specialized tool that uses high-pressure compressed air to loosen and excavate compacted soil to improve soil aeration, water infiltration, and root health in established landscapes.

ANSI A300 Standards – A nationally recognized set of professional standards developed by the American National Standards Institute that establish best practices for tree care.

B

Basin, Bioretention Basin – A depression filled with vegetation that collects and filters stormwater, allowing it to infiltrate into the soil, which reduces runoff and improves water quality.

Biodiversity – (1) The wildlife habitat and ecosystem value created by trees; and (2) a desired outcome advanced through intentional species diversity in planting.

Bioswale – A vegetated, sloped drainage feature that slows, filters, and absorbs stormwater, preventing runoff and allowing water to infiltrate the ground.

Built Environment – Human-made elements including, buildings, structures, roads, canals, paths, and trails, that together create the physical character of an area or community.

C

Canopy – See Tree Canopy.

Character – Unique features, qualities, and attributes that contribute to the identity of a place.

Cistern – Containers or tanks used to store rainwater collected from roofs for later use, typically for irrigation, as part of active water harvesting systems.

Context – The relationship between a location and its surrounding natural, planned, permitted, and/or built environment; the whole environment relevant to a particular building or place; the interrelated conditions in which something exists or occurs.

Covered Walkway – Shaded path or passage.

Curb Cut – Opening in street curbs that diverts stormwater from streets into green spaces, allowing water to infiltrate into the soil.

D

Deep Tilling – Loosening soil well below the surface (beyond typical grading depth) to reduce compaction, improve infiltration, and expand rootable soil for long-term tree health.

Dieback – Death of twigs, branches, or portions of the canopy, typically caused by stress (heat, drought, poor soils, pests, or improper watering), resulting in reduced shade performance.

Drip Irrigation – A low-water-use irrigation method that delivers water directly to plant roots through a network of tubes, minimizing water waste.

Durability – The ability to withstand wear, pressure, or damage.

E

Evapotranspiration – The combined process of evaporation from soil and other surfaces and transpiration from plant leaves, during which water absorbs heat as it changes from liquid to vapor.

F

Filtered Shade – Shade created by structures or trees that allow some sunlight to filter through, providing dappled light and reduced heat.

First Flush – The initial 0.5 inch of runoff from a storm event that often carries the highest concentration of sediment, trash, oils, and other pollutants.

Full Shade – An area that receives little to no direct sunlight, typically provided by dense tree canopies or overhead shade structures like canopies and pergolas.

G

Green Stormwater Infrastructure (GSI) – Nature-based stormwater practices (e.g., basins, bioswales, rain gardens, tree trenches) that capture, slow, filter, and infiltrate runoff to support vegetation, reduce runoff, and improve water quality. See also, Water Harvesting.

H

Heat Island – The phenomenon involving elevated temperatures in urban/suburban areas as compared with outlying rural/ undeveloped surroundings. Heat islands are generally caused by reduced vegetation, solar heat absorption, material heat capacity, use of energy, and building spacing.

Horizontal Shade Structures – Overhead elements like pergolas, canopies, or tensile fabric structures that provide shade over larger open areas, reducing surface temperatures and direct sun exposure.

I

J

K

L

Linear Bioswales – Long, narrow vegetated conveyance features (commonly along streets, medians, or parking edges) designed to intercept runoff, slow flow, filter pollutants, and promote infiltration.

Low Impact Development (LID) – Refers to design and implementation practices that can be employed at the site-level to both control stormwater and replicate the pre-development hydrology of the site. This approach to water management protects, restores, or mimics the nature water cycle on a development site.

M

N

O

P

Passive Water Harvesting – Systems that capture rainwater where it falls, allowing it to infiltrate into the soil naturally. Examples include bioswales, rain gardens, and permeable pavement.

Pavement Heaving – Upward lifting or cracking of pavement caused by roots, expansive soils, or inadequate subgrade/ soil design, often indicating insufficient root space.

Permeable Pavement – Paving materials that allow water to pass through the surface, reducing runoff and supporting groundwater recharge.

Public Realm – The environment created by the network of streets and open spaces, parks and plazas, and the pattern of uses and activity, which contribute to the character and quality of the place.

Q

R

Rain Garden – A planted depression that collects rainwater from roofs, streets, and other surfaces, allowing water to infiltrate into the soil and reduce stormwater runoff.

Right(s)-of-way – The strip of land over which certain transportation and/or other public facilities are built, including roads, sidewalks, and utility lines. A public right-of-way is typically dedicated or deeded to the public for public use and controlled by a public agency, such as the city.

Right Tree/Structure, Right Place – A performance-based planning and design principle that matches tree species and/or shade structure type, size, and placement to site conditions and intended shade outcomes—prioritizing south and west exposures for afternoon relief, using site-specific shade diagrams, and accounting for constraints such as utilities, soil volume, hardscape conflicts, and water availability so shade elements can thrive and function long-term.

Root Flare – The natural widening at the base of the trunk where major roots begin; it should be visible at or slightly above finished grade to avoid trunk rot and instability.

Root Zone – The soil volume where a tree's roots grow and function (water, oxygen, nutrients); protecting and expanding this zone supports canopy growth and shade longevity.

S

Safe-to-touch – A performance benchmark indicating that a surface is suitable for short-duration contact under expected hot-weather conditions. For this Plan, the benchmark assumes brief contact (about 5 seconds) and is generally met when surface temperatures are at or below approximately 140°F during peak summer conditions.

Sediment Forebay – A small, dedicated pretreatment pool located at the inlet of a basin area that slows incoming runoff so coarse sediment and debris settle out in an accessible location, protecting downstream infiltration media and reducing long-term maintenance demands.

Sediment Trap – A pretreatment feature installed at stormwater entry points (such as curb cuts, inlets, or grate openings) that captures sediment, trash, and debris before runoff enters basins, bioswales, rain gardens, or other water-harvesting features to help prevent clogging, protect infiltration performance, and simplify maintenance.

Shade Goals – Targets established within the Scottsdale Shade & Tree Plan to increase the percentage of shade coverage throughout the city, with specific goals for different land uses, such as parks, streetscapes, and commercial areas.

Shade Infrastructure – An interconnected system of trees, shade structures, and water-harvesting practices.

~~Soil Cell – A modular, load-supporting subgrade system installed beneath pavement that creates uncompacted soil volume for healthy tree root growth while supporting the hardscape above.~~

Soil Fracturing – Targeted loosening of compacted soils to restore pore space, improve infiltration, and reduce root stress without major excavation.

Structural Soil – Engineered soil designed to support both plant growth and pavement weight, allowing tree roots to grow and breathe in compacted urban areas.

SUSPENDED PAVEMENT – A PAVEMENT-SUPPORT SYSTEM THAT CARRIES SIDEWALKS, PLAZAS, OR PARKING AREAS ON A STRUCTURAL DECK, FRAME, OR CELL SYSTEM SO THAT SOIL BENEATH REMAINS LARGELY UNCOMPACTED AND USABLE FOR TREE ROOTS AND STORMWATER INFILTRATION.

T

Tensile Fabric – A durable, UV-stable shade fabric installed under tension (e.g., shade sails) that provides immediate shade, typically used where trees are not feasible or need supplemental coverage.

Treatment Train – A sequence of stormwater features used together to improve performance, typically combining pretreatment with infiltration/filtration practices to capture, slow, filter, and infiltrate runoff.

Tree Canopy, Tree Crown – The top part of a tree, containing its branches, leaves, flowers, and fruits, extending from where the main branches emerge from the trunk, responsible for photosynthesis, transpiration, and overall energy production for the tree.

Tree Guying – Stabilizing a tree using guy wires/straps anchored to the ground, typically for larger-caliper trees or windy sites; adjusted to avoid bark damage and removed after establishment.

Tree Staking – Temporary supports used to stabilize a newly planted tree during establishment while allowing enough movement to develop trunk strength; removed once the tree is self-supporting.

U

Ultraviolet (UV) – Invisible radiation from sunlight that can be harmful; effective shade reduces UV exposure in outdoor spaces and improves comfort, especially during peak sun hours.

V

Vertical Shade Structures – Shade structures like screens or louvers installed vertically to block sunlight from west- or south-facing areas. Often used in narrow spaces, these structures typically maintain 60% transparency for safety and visibility.

Volunteer Tree – A self-established tree that was not intentionally planted. Volunteer trees may be desirable or undesirable and are evaluated for retention or removal based on site conditions.

W

Water Harvesting – The practice of collecting and using rainwater for landscape irrigation or other non-potable uses, either passively (e.g., through bioswales and rain gardens) or actively (e.g., through cisterns and gray water systems).

X

Y

Z

RELATED PLANS & POLICIES

A

- Arizona Department of Water Resources Low Water Use and Drought Tolerant Plant List

B

C

- Commercial Solar Guidelines (2020)

D

- Design Standards and Policies Manual (2018)
- Drought Management Plan (2021)

E

- Environmentally Sensitive Lands Ordinance (1991 + amendments)

F

- Frank Lloyd Wright Streetscape Design Guidelines (1991)

G

- Greater Phoenix Green Infrastructure Handbook: Low Impact Development (LID) Details for Alternative Stormwater Management (2019)
- Green Building (LEED™) Policy for New City Construction and Remodels (2005)
- Green Building Design Principles
- Green Building Program and Guidelines

H

I

- Identifying Strategies for a Cooler Scottsdale (2020)
- Integrated Water Resources Master Plan (2022)
- International Energy Conservation Code (IECC) for Commercial and Residential Projects
- International Green Construction Code (IGCC) For Commercial Projects

J

K

L

M

- MAG Complete Streets Guide (2011)
- MAG Desert Spaces Environmentally Sensitive Development Areas Policies and Design Guidelines (2000)
- MAG Desert Spaces Plan (1995)
- MAG Pedestrian Policies and Design Guidelines (2005)
- McDowell Road Design Guidelines (2003)
- McDowell Sonoran Preserve Access Area Design and Site Standards (1999)

N

O

- Old Town Scottsdale Urban Design and Architectural Guidelines (2024)

P

- Parks and Recreation Master Plan (2024)
- Phoenix Cool Pavement Program
- Phoenix Cool Corridor Program

Q

R

- Residential Solar Guidelines (2016)

S

- Scenic Corridor Design Guidelines (2004)
- Scottsdale General Plan 2035 (2021)
- Scottsdale i-Tree Analysis (2024)
- Scottsdale Road Streetscape Design Guidelines (2008)
- Scottsdale Water Strategic Plan (2025 - 2030)
- Sensitive Design Principles (2001)
- Shea Boulevard Streetscape Design Guidelines (1994)
- Stormwater Management Plan (2022)

T

- TRANSPORTATION ACTION PLAN (2022)

U

V

- Via Linda Streetscape Design Guidelines (1994)

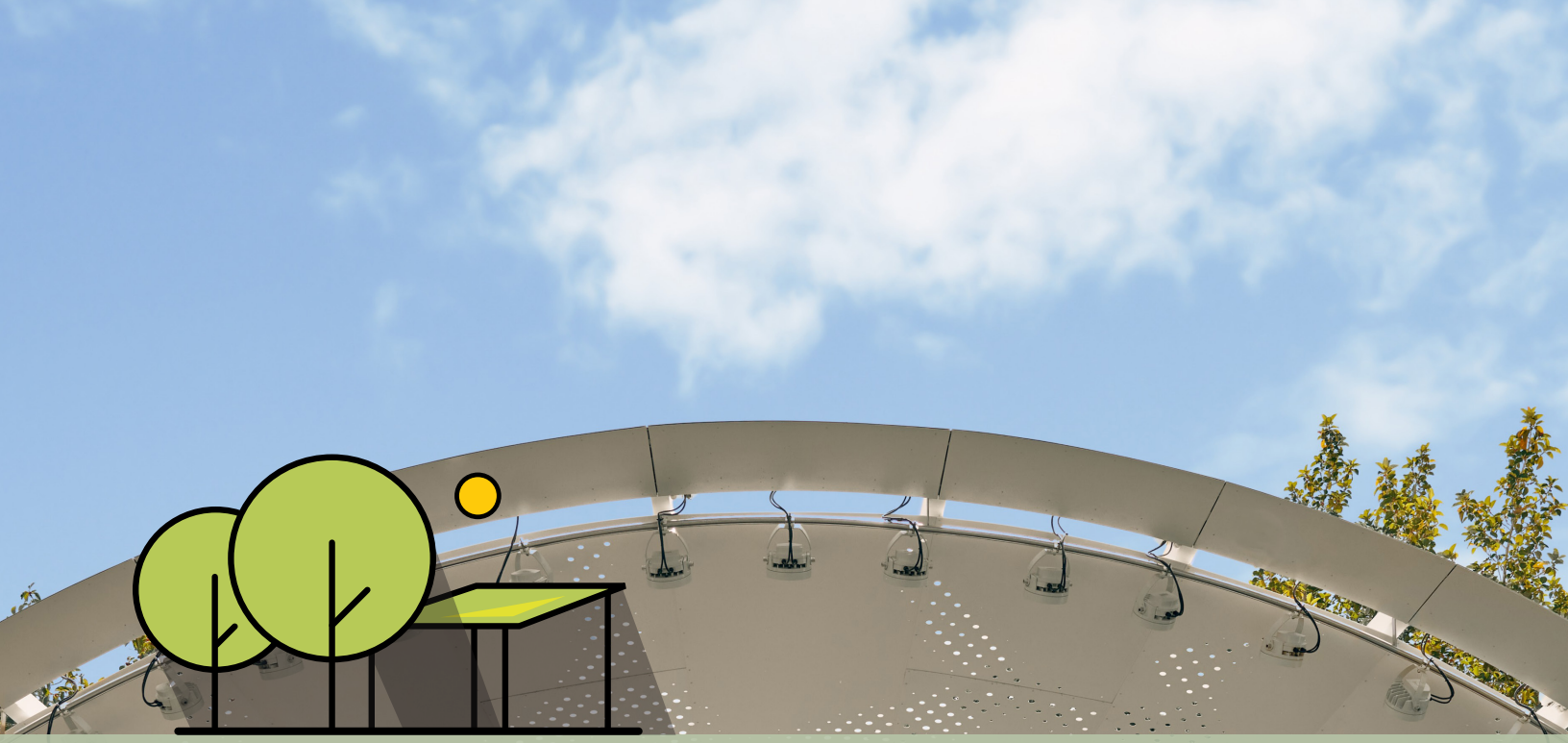
W

X

Y

Z

- Zoning Ordinance



SHADE & TREE PLAN FOR THE BUILT ENVIRONMENT

CITY OF SCOTTSDALE

RESOLUTION NO. 10
ADOPTED MONTH DAY, 2026

February 2026 Draft
Includes tracked edits resulting from PUBLIC and BOARD/COMMISSIONS input.

If adopted at the May 7, 2026 Development Review Board meeting, a clean, public-facing version of the Plan will be prepared to incorporate all Board-approved revisions and will serve as the adopted Plan for future project planning and design review.

RESOLUTION NO. 10

A RESOLUTION OF THE DEVELOPMENT REVIEW BOARD OF THE CITY OF SCOTTSDALE, MARICOPA COUNTY, ARIZONA, DECLARING AS A PUBLIC RECORD, AND ADOPTING IN ITS ENTIRETY, THE SHADE & TREE PLAN FOR THE BUILT ENVIRONMENT, AND APPROVING AN AMENDMENT TO THE CITY OF SCOTTSDALE DESIGN STANDARDS AND POLICIES MANUAL TO REFERENCE SAID PUBLIC RECORD.

WHEREAS, in Section 1.902(A) of the Scottsdale Zoning Ordinance, Powers of the Development Review Board, the Development Review Board has the authority to adopt by resolution design policies and guidelines that support the character and design goals and policies of the General Plan; and

WHEREAS, the Scottsdale Design Standards & Policies Manual (DS&PM) references citywide, site planning design guidelines in addition to the other standards contained in the General Plan, Zoning Ordinance, Character Area Plans, and the DS&PM; and

WHEREAS, the Shade & Tree Plan for the Built Environment was developed as city design guidance to help maintain and expand shade infrastructure citywide, including trees, water-harvesting practices, and shade structures; and

WHEREAS, the Development Review Board, by the authority granted by the City Council, wishes to adopt the Shade & Tree Plan for the Built Environment and to amend the DS&PM to reference the Plan.

THEREFORE, LET IT BE RESOLVED, by the Development Review Board of the City of Scottsdale, Maricopa County, Arizona, as follows:

Section 1. That certain document entitled the “Shade & Tree Plan for the Built Environment” is adopted to serve as citywide design guidance for shade infrastructure within the municipal boundaries of the City of Scottsdale, Maricopa County, Arizona.

Section 2. That certain document entitled the “Shade & Tree Plan for the Built Environment” is hereby declared a public record, three electronic and/or print copies of which are on file in the Planning and Development Services Department, and are ordered to remain there for public use and inspection.

Section 3. Page 65 of the Scottsdale Design Standards & Policies Manual (DS&PM) is amended to include the Shade & Tree Plan for the Built Environment as a referenced design guideline document, as set forth in Exhibit A attached hereto and incorporated by reference.

Section 4. This Resolution shall become effective 30 days after adoption by the Development Review Board.

PASSED AND ADOPTED by the Development Review Board of the City of Scottsdale, Maricopa County, Arizona this _____day of _____, 2026.

15964548

ATTEST:

By:_____
Brad Carr
Development Review Board Coordinator

DEVELOPMENT REVIEW BOARD,
a board of the City of Scottsdale

By:_____
Solange Whitehead
City Council Representative,
Board Chair

APPROVED AS TO FORM:

By:_____
Joe Padilla, Deputy City Attorney

E. **Restaurant Design Guidelines:**
This set of guidelines is applicable to all restaurant types. The guidelines are intended to promote good design that is responsive to its contextual setting. The guidelines outline the city's expectations with regard to restaurant design and are intended to assist applicants, decision-makers, and staff in the consistent development, review, and consideration of restaurant proposals.

F. **Scenic Corridor Design Guidelines:**
This set of guidelines includes policies, standards, details, and concepts to create and maintain the basis for visual character within and along roadways designate by the General Plan as having an emphasis on retaining and displaying the native desert and traditional southwest cultural heritage of the area.

G. **Additional Design Guidelines:**
In addition to the above referenced design guidelines, the City of Scottsdale (city) has other common guidelines and policy available on the city's website (www.ScottsdaleAZ.gov) that include, but are not limited to:
1. Designing for the Desert: Shading
2. Exterior and Site Lighting Design Guidelines
3. ATM Lighting Design Guidelines
4. Scottsdale 'Desert' Parks Design Guidelines
5. Scottsdale Golf Courses Policy
6. Scottsdale Road Streetscape Design Guideline
7. Shea Blvd Streetscape Guidelines
8. Frank Lloyd Wright Streetscape Design Guidelines
9. McDowell Road Streetscape Guidelines
10. Via Linda Streetscape Guidelines
11. SHADE & TREE PLAN FOR THE BUILT ENVIRONMENT

ADDITIONAL DESIGN GUIDELINES 2-1.200

Scottsdale has developed specific design standards for all development that is subject to the DRB process. Unless specifically modified by the DRB or City Council through stipulation(s), all development shall incorporate the following:

SITE CONTEXT 2-1.201

The following guidelines focus on the relationship of a proposed site plan to the natural terrain of the property, as well as the relationships this proposal will have with existing or planned uses adjacent to it. The goals are to fit development into the natural site with minimal intrusion, and to be sensitive to adjacent uses.

TERRAIN 2-1.202

A. Incorporate the natural site features, such as washes or native desert vegetation, into a site design.
B. Incorporate desert washes as site amenities. Orient common recreational, patio, outdoor dining, and other such facilities toward such natural features.
C. Incorporate major vistas and view corridors that give special emphasis to mountains, natural features, or open space areas in to the site and building design.

Comment	Applicable Page/Goal/Policy/Section	Public Outreach Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
		General Comments/Suggestions			
1	General	I very much enjoyed reading the full plan. The more shade, the better especially when it is green. However, nowhere did I see employing full time trained arborists to maintain the health of the trees we have or those we plan to have. Certainly seeing the latest trimming by the street crews of the plants on Indian School, my faith in the city being able to properly care for these plants is a little shaky. Over trimming trees and bushes into topiary or other unnatural shapes shortens their lives, creates unnecessary green garbage, and uses more water than when plants are mostly left in natural shapes. It also deprives the public of seeing plants in full bloom and natural shapes. The artificial trimming into disciplined shapes isn't necessary since proper space between plants was observed at time of planting. I also saw no specific mention of requirements to preserve current healthy trees by developers when they are building. Do I understand that future building permits will require developers to include water saving and retention features? If so, Bravo!	Noted. TR 14 through TR 16 establishes maintenance expectations, including a recommendation that pruning on City-owned property be conducted under the supervision of an ISA-Certified Arborist (TR 14.1). TR 14.7 discusses avoiding the relocation or removal of mature trees. Although the plan includes design guidance for on-site water, the plan as drafted is design guidance and not a regulatory document.	Online Public Comment	3/13/2026
2	General	I think the plan is well thought out with a vision that would work. I recommend to include homes to be included as part of the plan. I have added 6 trees over the past 6 years and could do more to support the work to fight our heat island.	The plan is not intended for individual residential properties. properties. However, trees planted on residential properties could voluntarily apply the Plan's guidance related to tree placement, species selection, water efficiency, and long-term health. In addition, a future residential-focused idea book may develop in a subsequent phase to provide homeowners with practical shade, tree, and water-harvesting concepts.	Online Public Comment	3/16/2026
3	General	The entire Shade Tree packet is AWESOME and includes incredible detail for any user as guidelines. Great work, Team!!	Noted.	Online Public Comment	3/18/2026
4	General	General support for residential shade idea book.	Noted.	Focus Group	3/24/2026
5	General	Encourage tree planting in residential areas through education and incentives, rather than mandates.	The Shade & Tree Plan is intended to provide design guidance. Scottsdale does not regulate landscape design for individual single-family residential properties, with the exception of requirements related to the location of non-native plants, the location of artificial turf, and the revegetation of natural areas open space within the Environmentally Sensitive Lands Overlay District.	Focus Group	3/24/2026
6	General	Consider programs that provide resources (free trees) to support canopy expansion.	Scottsdale City Charter places limitations on the provision of public funds to individual private property owners. Generally, the plan contemplates neighborhood support tools under the Collaborate on Shade goal, including potential small-scale grants or tool-lending programs.	Focus Group	3/24/2026
7	General	Coordinate broader outreach efforts for residents (HOAs, Constituent Services)	The plan is not intended for individual residential properties. However, trees planted on residential properties could voluntarily apply the Plan's guidance related to tree placement, species selection, water efficiency, and long-term health. In addition, a future residential-focused idea book may develop in a subsequent phase to provide homeowners with practical shade, tree, and water-harvesting concepts.	Focus Group	3/24/2026
8	General	Wonderful idea and desperately needed. As a senior , riding the buses and our fantastic trolley, I can attest to many close calls on the verge of collapse without shade at most stops in our brutal summer heat. Shaded stops with seating have even been removed . Finding any nearby shade is often in dirt or uneven rocks, if at all , and blocks views to determine if the bus or trolley is near while trying to keep bags of food off hit ground with pests . Passengers have discussed signing a petition but many expressed the City doesn't care about us and recognize the concerns that unhoused may camp out on any seating . I can't tell you how many overheated unhoused seniors I've found in bushes . It's horrific . So, without having reviewed your plans and potential designs , I am making the request to please consider placing shade structures at ALL public transportation stops in the city . I initially had an idea to create a citywide contest for all artists interested to come together and design unique stops with seating that would provide relief for overheating residents who need shade and a seat with a place to hold bags to avoid them melting on hot ground . In other words , in line with the city's focus on the arts , make each stop a piece of art with the winning designs engraved with the artist's name . Each stop could represent something unique about Scottsdale and there are ways to design seating to deter sleeping . Just a thought but we need help ! Thank you 🤳!	The draft plan recognizes transit stops as an important public realm location for shade infrastructure. However, the plan itself does not establish funding for such improvements. Further, the plan is not regulatory and does not direct shade improvements at specific transit stop locations. Bus stop improvements are typically evaluated by the City's Transportation and Infrastructure Department in coordination with Valley Metro, with consideration given to ridership, site conditions, and related operational factors.	Online Public Comment	3/26/2026
9	General	I am concerned about golf course area--Vista Camino area--lining of lakes.	The concern as stated does not appear to relate directly to the subject matter of the draft Shade & Tree Plan for the Built Environment, which focuses on shade infrastructure, including trees, water-harvesting practices, and shade structures. No specific change to the draft plan is identified in relation to this comment.	Open House Public Comment	3/26/2026
10	General	Developers are required to plant trees at the time of their construction but no one from the city follows-up and makes certain the trees are maintained. Often the original trees die and are never replaced. Result is dozens of empty treewells in Old Town.	The City may address missing or dead required landscape materials through review of previously approved site plans and, where applicable, through code enforcement processes. In addition, the draft plan (TR 14 through TR 16) includes a maintenance-focused section intended to emphasize the importance of proper pruning, watering, monitoring, and replacement practices to support long-term canopy health and shade performance.	Open House Public Comment	3/26/2026
11	General	Expand the area this applies to beyond Old Town to the rest of south Scottsdale where all the old growth trees are that provide the most shade!	The draft plan is already intended to apply citywide, including areas beyond Old Town. While the document includes a more detailed section for Old Town due to its distinct context, the overall guidance is broader in scope and recognizes the importance of existing mature canopy throughout Scottsdale, including south Scottsdale.	Open House Public Comment	3/26/2026

Comment	Applicable Page/Goal/Policy/Section	Public Outreach Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
12	General	This is an outstanding plan and I would like to contribute to it in two ways. First is to look at how our street infrastructure contributes to our heat island. According to the 2022 Transportation Action Plan the City of Scottsdale maintains more than 207,000,000 square feet of asphalt comprising our streets and alley ways. This computes out to nearly 7 ½ square miles. Imagine a sea of asphalt that stretches north on Scottsdale Road from McKellips Road to McCormick Parkway and east to Hayden Road. This does not include surface parking associated with retail, office complexes and industry. Any attempt to curb our heat island effect must include ideas to reduce the asphalt that consumes so much of our city's area. Second, is to increase the emphasis on ground cover listed on page 17 of the plan and expand it to include shrubbery to shade walls. The following photo is from a study I did as part of my master's program several years ago and shows how ground and wall coverings impact the heat sump associated with various hardscapes. An east facing wall completely shaded remains cool all day with no radiant heat in the evening. An identical wall facing west with no shade serves as a heat sump that radiates heat well into the evening.	The draft plan is focused specifically on shade infrastructure, including trees, water-harvesting practices, and shade structures, rather than on roadway design, pavement reduction, or wall-covering treatments. While the plan does address tree placement near buildings and structures in part to support shade performance, it is not intended to serve as guidance for wall coverings or similar treatments.	Open House Public Comment	3/26/2026
13	General	I enthusiastically support this process.	Noted.	Online Public Comment	4/6/2026
14	General	Hi! I offer downtown walking tours - and do about 50 during the Season. But off Season it can be brutal for both my out of town (country) guests and me! I've been thinking for the last 2 years how to mitigate this. Especially that long hot, unshaded stretch along Marshall Way from Main to Fifth Avenue. Help! I have arranged to have planted 100+ trees in my gated community Scottsdale House. I reached out to SRP and Trees Matter to include developments like ours in their free 2 trees program they offer 2 x a year to their customers. I'd take n advantage of it in my last 2 homes. Great healthy trees and all you have to do as an SRP customer is sit through an informative hour Zoom presentation and promise to plant your 2 trees where they'll shade an air-conditioned building. Easy and fun! And it helps them fulfill their Corporation Commission mandate of helping their customers reduce their energy usage! WIN WIN! I'm quite certain that all downtown is SRP energy provided. They currently don't allow businesses to participate - but I think a citizen led informal petition motivated by YOUR efforts here — could convince them to let business owners call over downtown get 2 free trees for their building! VIOLA! Maybe hundreds of new trees free. City might have to help with watering to get them started. (Rain collection). Maybe Scottsdale Arts provides pots where there's no dirt. Either an SRP logo or another generous corporation? I want to help. Biz owner AND resident.	The draft plan recognizes pedestrian-oriented areas such as Old Town as important locations for shade infrastructure over time. At this stage, however, the plan remains in draft form and has not been adopted. Scottsdale City Charter places limitations on the provision of public funds to individual private property owners. Further, the plan does not establish specific programs, partnerships, or implementation commitments of the type described.	Online Public Comment	4/6/2026
15	General	I am not an expert but this portion of the report is technical and looks to be excellent and helpful to citizens.	Noted.	Online Public Comment	4/9/2026
16	General	I am so excited that Scottsdale is focusing on shade and trees for the city! I particularly loved the focus on native trees and would love to see more native trees in the parks and around town. I live near chaparral park and there are some non-native, low water use plants but seeing more natives would be amazing. The sonoran desert has so many wonderful native trees that I feel the citys under-utilize in their plans and would really love to see more (especially ironwoods and palo verdes for their blooms).	Noted	Online Public Comment	4/9/2026

Comment	Applicable Page/Goal/Policy/Section	Public Outreach Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
Introduction					
17	Page 8, Understanding Heat	Thoroughly support the plan. Two quick comments: 1. Figure 0-1 on page 8 is of critical importance to understanding why we need shade and tree planning in the city. Average high temperature in July is an unmistakable trend upward. Trees and shade will help that trend. 2. Regarding the goals ""maintain our shade"" and ""increase our shade"" ... I have little doubt that on a net basis, we are slowly losing tree canopy. Every year during monsoon in my neighborhood, we lose older and full grown trees on private land and landscape, and they are not replaced, or if they are, it is with a sapling that won't provide the shade for 15-20 years. Objective 1.2 is spot on: we need to have an inventory of public trees and shade.	Noted.	Online Public Comment	4/9/2026
18	Page 12, Benefits of Shade Infrastructure	The word "sustains" is spelled incorrectly in the 3rd paragraph.	Spelling has been corrected.	Public Comment	4/1/2026
19	Pages 17, 58, 108, 111, Gray Water	Preference for utilizing "greywater" as a term and not "gray water" which is utilized in the draft document.	Both spellings are acceptable. Scottsdale Water prefers this spelling. It also aligns with ADEQ and state statute.	Public Comment	4/1/2026
20	Page 20, Vision	Do we want this picture of artificial turf underneath vision?	Images on this page are for decorative purposes only. Photos within the document that are for illiustrative purposes have captions.	Public Comment	4/1/2026
21	Page 25, Advancing Citywide Shade Goals	Are these graphics too small showing the house?	The document will be published as a high-resolution PDF. Further, the focus of the graphic is sun path orientation.	Public Comment	4/1/2026
Tree Guidelines					
22	Tree Guidelines, General	This is sort of an aside...I am all for shade trees and canopies, but we also need signage visibility for commercial buildings. Hoping there can be some explicit consideration and planning for this.	The draft plan recognizes that tree placement, sight visibility, and pruning are important site design considerations. At the same time, the plan is not intended to regulate signage, which is addressed through the Zoning Ordinance and related development standards. In practice, maintaining visibility of commercial signage is primarily a matter of site planning, including how trees and other landscape materials are located at the time of development, and how those materials are maintained over time.	Online Public Comment	3/23/2026
23	Tree Guidelines, General	Consider future requirements for tree inventories beyond existing ESL processes. Include landscape architects in ESL plant inventory and preservation planning to improve outcomes.	Currently, any project which affects protected native plants is required to submit a native plant program detailing the existing location and proposed treatment of each protected plant impacted. Including landscape architects among the city's approved native plant salvage contractors would be better suited for a regulatory update process.	Focus Group	3/24/2026
24	Tree Guidelines, General	Strengthen enforcement for tree health, replacement, and overall shade.	Updated Text Page 22, Objective 3.1 Establish a coordinated shade-infrastructure program that **SUPPORTS INSPECTION AND COMPLIANCE EFFORTS**, organizes maintenance priorities and identifies potential external funding or grant opportunities.	Focus Group	3/24/2026
25	Tree Guidelines, General	Incorporate incentives and/or recognition programs to encourage proper tree maintenance and stewardship.	The Collaborate on Shade goal includes Objective 3.3 which states "Recognize and incentivize community contributions." This falls under the overarching Objective 3 to "Support community implementation and participation."	Focus Group	3/24/2026
26	Tree Guidelines, General	Explore penalties or compliance mechanisms for poor maintenance outcomes.	Updated Text Page 22, Objective 3.1 Establish a coordinated shade-infrastructure program that **SUPPORTS INSPECTION AND COMPLIANCE EFFORTS**, organizes maintenance priorities and identifies potential external funding or grant opportunities.	Focus Group	3/24/2026
27	Page 31, TR 1	The Guidelines recommend spacing trees 20'-0" apart with a note that smaller trees may be planted closer together. There should also be a note that larger trees may be planted farther apart. For example, the AMWUA website states that Chinese Pistache trees can be 35' wide when mature. Go look at the one growing at the southeast corner of Indian School and Miller Road. Also, the more recently planted trees along Indian School Road are about 30' apart. If Pistache trees are planted 20' apart there will be added maintenance costs in the future and the mature trees will not be able to grow to their full potential.	The plan's Tree Guide identifies the mature size of Chinese Pistache as 30 feet in height by 25 feet in width. The recommended spacing is intended to provide a general parameter for achieving continuous shade coverage. Updated Text Page 31 Tree Placement TR 1 **FOR PEDESTRIAN AND STREET FRONTAGES**, ensure proper **MATURE** canopy overlap while allowing sufficient room for growth. TR 1.1 **A MAXIMUM OF 25**' measured from trunk to trunk is recommended (25' O.C. - on center). **REFER TO THE TREE LISTS AND TREE GUIDES BEGINNING ON PAGE 38 FOR RECOMMENDED PLACEMENT ON INDIVIDUAL SPECIES.**	Online Public Comment	3/9/2026
28	Page 31, TR 1	Allow flexibility in tree spacing rather than a fixed 20' on-center standard to account for site conditions.	Updated Text Page 31 Tree Placement TR 1 **FOR PEDESTRIAN AND STREET FRONTAGES**, ensure proper **MATURE** canopy overlap while allowing sufficient room for growth. TR 1.1 **A MAXIMUM OF 25**' measured from trunk to trunk is recommended (25' O.C. - on center). **REFER TO THE TREE LISTS AND TREE GUIDES BEGINNING ON PAGE 38 FOR RECOMMENDED PLACEMENT ON INDIVIDUAL SPECIES.**	Focus Group	3/24/2026
29	Page 31, TR 1	Adjust spacing by species and mature canopy size, with 25' on-center appropriate in some contexts (e.g., street frontages).	Updated Text Page 31 Tree Placement TR 1 **FOR PEDESTRIAN AND STREET FRONTAGES**, ensure proper **MATURE** canopy overlap while allowing sufficient room for growth. TR 1.1 **A MAXIMUM OF 25**' measured from trunk to trunk is recommended (25' O.C. - on center). **REFER TO THE TREE LISTS AND TREE GUIDES BEGINNING ON PAGE 38 FOR RECOMMENDED PLACEMENT ON INDIVIDUAL SPECIES.**	Focus Group	3/24/2026

Comment	Applicable Page/Goal/Policy/Section	Public Outreach Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
30	Page 31, TR 1	Clarify how spacing is measured (“on-center”) and relate requirements to mature canopy spread.	Updated Text Page 31 Tree Placement TR 1 **FOR PEDESTRIAN AND STREET FRONTAGES**, ensure proper **MATURE** canopy overlap while allowing sufficient room for growth. TR 1.1 **A MAXIMUM OF 25**' measured from trunk to trunk is recommended (25' O.C. - on center). **REFER TO THE TREE LISTS AND TREE GUIDES BEGINNING ON PAGE 38 FOR RECOMMENDED PLACEMENT ON INDIVIDUAL SPECIES.**	Focus Group	3/24/2026
31	Page 31, TR 1	Consider framing spacing as a target or guideline rather than a strict requirement due to enforcement challenges.	The plan as drafted is design guidance and not a regulatory document.	Focus Group	3/24/2026
32	Page 31, TR 2	Consider defining “larger” versus “smaller/non-invasive” trees (TR2).	Updated Text TR 2.2 5’ minimum may be appropriate for smaller trees with non-invasive root systems. **Refer to the Tree Lists and Tree Guides beginning on page 38**.	Focus Group	3/24/2026
33	Page 31, TR 2	Differentiate standards by location (e.g., street frontage vs. internal site areas).	Updated Text Page 31 Tree Placement TR 1 **FOR PEDESTRIAN AND STREET FRONTAGES**, ensure proper **MATURE** canopy overlap while allowing sufficient room for growth. TR 1.1 **A MAXIMUM OF 25**' measured from trunk to trunk is recommended (25' O.C. - on center). **REFER TO THE TREE LISTS AND TREE GUIDES BEGINNING ON PAGE 38 FOR RECOMMENDED PLACEMENT ON INDIVIDUAL SPECIES.**	Focus Group	3/24/2026
34	Page 31, TR 2	Avoid placing trees in undersized planting areas; ensure minimum viable space (e.g., ~10’ x 10’ for small trees).	Noted. Pages 34 - 35 contemplate Soil Volume.	Focus Group	3/24/2026
35	Page 31, TR 2	Figure 1-2. Wouldn't this go to the bldg?	Adjusted.	Public Comment	4/1/2026
36	Page 32, TR 3	Does this mean that the min. landscape buffer in Scottsdale is 7'?	The Zoning Ordinance has specific requirements for landscape buffers. This guideline is intended to promote shaded hardscape (particularly pedestrian pathways) while considering potential conflicts.	Public Comment	4/1/2026
37	Page 32, TR 4	Clarify clearance requirements (vertical vs. horizontal).	Updated text Page 32, TR 4.2 **13.5' VERTICAL CLEARANCE** from drivelanes is recommended.	Focus Group	3/24/2026
38	Page 32, TR 4	Provide guidance on how required distances interact with building setbacks.	Vertical clearance was shown as horizontal before text was updated. See above.	Focus Group	3/24/2026
39	Page 32, TR 4	Account for site visibility, lighting, and utilities when determining spacing and placement.	Guidelines TR 1-5, as drafted, contemplate other external factors that could affect tree placement.	Focus Group	3/24/2026
40	Page 33, TR 5	Reference utility-specific standards for separation distances rather than prescribing a fixed requirement.	TR 5.1, as drafted, discusses consulting utility providers to avoid conflicts generally as those standards may change over time.	Focus Group	3/24/2026
41	Page 33, TR 5	Avoid including root barriers as a standard requirement, as they may negatively impact tree stability and could become unintentionally mandated.	Intent is for root barriers to remain an optional alternative in appropriate site contexts.	Focus Group	3/24/2026
42	Page 33, TR 5	Provide best practice guidance for tree placement near utilities (e.g., species selection, irrigation strategies).	TR 5.2 references the document's Tree List which provides detailed species characteristics to help inform selection.	Focus Group	3/24/2026
43	Page 33, TR 5	Recognize utility placement as a primary constraint and explore opportunities for improved coordination where feasible.	TR 5.1 notes consultation with utility providers to avoid conflicts.	Focus Group	3/24/2026
44	Page 34, TR 7, Figure 1-6. Soil Volume	Move #'s off the dimension lines, typ.	Adjusted.	Public Comment	4/1/2026
45	Page 35, TR 7, Figure 1-7. Soil Cells	We use the term suspended pavement when talking about the generic concept of providing rootable space under hardscape	Correct. "Suspended Pavement" is now utilized throughout the document, where "soil cells" is a type or component within a suspended pavement system. Updated Text Page 35, Supporting guideline TR 7.2 ~~**Soil cells**~~**SUSPENDED PAVEMENT** may be utilized in hardscaped areas or areas where 1,000 CF of soil volume cannot be achieved. Page 35, Inset text heading **SUSPENDED PAVEMENT**: SOIL CELLS Page 68, Suspended Pavement description Suspended pavement systems, **SUCH AS SOIL CELLS,** support sidewalks, plazas, or parking areas on a structural deck or frame so that soil beneath remains largely uncompacted and usable for tree roots and stormwater infiltration. They often work with structural soils ~~**or soil cell systems**~~ to provide both loading capacity and high-quality rooting volume. Page 110, Soil Cell Glossary Term deleted, added Suspended Pavement term **SUSPENDED PAVEMENT – A PAVEMENT-SUPPORT SYSTEM THAT CARRIES SIDEWALKS, PLAZAS, OR PARKING AREAS ON A STRUCTURAL DECK, FRAME, OR CELL SYSTEM SO THAT SOIL BENEATH REMAINS LARGELY UNCOMPACTED AND USABLE FOR TREE ROOTS AND STORMWATER INFILTRATION.**	Public Comment	4/1/2026
46	Page 35, TR 7-8	Reevaluate feasibility of cubic soil volume requirements, particularly for local development practices.	The guidelines are not one-size-fits-all and allow flexibility in the provision of soil volume for tree and root growth.	Focus Group	3/24/2026
47	Page 35, TR 7-8	Consider larger planting areas/planters, while acknowledging trade-offs (e.g., parking impacts).	The Soil Volume & Quality section is intented to illustrate the importance of soil volume. Trade-offs or incentives - such as reduced parking requirements - would necessitate a regulatory update.	Focus Group	3/24/2026
48	Page 35, TR 7-8	Use soil cells as an optional strategy for constrained sites rather than a requirement.	TR 7.2 notes that "soil cells *may* be utilized".	Focus Group	3/24/2026
49	Page 35, TR 7-8	Prioritize providing adequate uncompacted soil volume to support long-term tree health.	TR 7 and TR 8 note the importance of providing uncompacted soil.	Focus Group	3/24/2026

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50	Page 35, TR 7-8	Avoid requiring soil amendments universally; native soil may be preferable to prevent drainage issues.	Updated Text Page 35 Soil Volume & Quality TR 8 Prepare **COMPACTED** soils **WHEN NECESSARY** to **ENSURE** ~~**improve structure, water infiltration, and nutrient availability, creating the foundation for**~~ healthy tree establishment. TR 8.1 Amend compacted soils with organic matter or mulch to improve water retention and nutrient availability (around rootball only and not below to avoid sinking as the organics break down). **UTILIZE SUITABLE NATIVE SOIL WHERE FEASIBLE.**	Focus Group	3/24/2026
51	Page 35, TR 7-8	Position soil guidance as educational rather than strictly regulatory, especially given enforcement limitations.	This document provides design guidance and is not regulatory.	Focus Group	3/24/2026
52	Page 35, TR 7-8	Enhance graphics and diagrams to better illustrate soil volume, depth, and planting conditions.	Page 34, Figure 1-6 updated to note dimensions are for illustrative purposes.	Focus Group	3/24/2026
53	Page 36, TR 9	Apply tree diversity standards (e.g., 30/20/10 rule) selectively, perhaps focusing on large-scale, civic, or roadway projects.	Updated Text Page 36 Tree Diversity TR 9 Prevent monocultures (plantings dominated by a single species or family) by ~~ensuring~~ **PROVIDING** a balanced mix of ~~plant~~ **TREE** varieties ~~according to the 30/20/10 Rule~~. TR 9.1 **FOR ROADWAY, CIVIC, AND LARGE-SCALE PRIVATE DEVELOPMENTS THAT MAY AFFECT OR ALTER THE CONTEXT AREA THROUGH LANDSCAPE DESIGN, CONSIDER APPLYING THE 30/20/10 RULE, WHERE** no more than 30% of plants in a landscape PLAN ~~should~~ belong to the same family, no more than 20% ~~of the plants~~ should belong to the same genus, **AND** no more than 10% ~~of the plants~~ should belong to the same species.	Focus Group	3/24/2026
54	Page 36, TR 9	Avoid strict diversity requirements for small or private developments, where implementation may be impractical.	Updated Text Page 36 Tree Diversity TR 9 Prevent monocultures (plantings dominated by a single species or family) by ~~ensuring~~ **PROVIDING** a balanced mix of ~~plant~~ **TREE** varieties ~~according to the 30/20/10 Rule~~. TR 9.1 **FOR ROADWAY, CIVIC, AND LARGE-SCALE PRIVATE DEVELOPMENTS THAT MAY AFFECT OR ALTER THE CONTEXT AREA THROUGH LANDSCAPE DESIGN, CONSIDER APPLYING THE 30/20/10 RULE, WHERE** no more than 30% of plants in a landscape PLAN ~~should~~ belong to the same family, no more than 20% ~~of the plants~~ should belong to the same genus, **AND** no more than 10% ~~of the plants~~ should belong to the same species.	Focus Group	3/24/2026
55	Page 36, TR 9	Consider limiting diversity requirements to rights-of-way and medians, where monoculture risks are more prevalent.	Updated Text Page 36 Tree Diversity TR 9 Prevent monocultures (plantings dominated by a single species or family) by ~~ensuring~~ **PROVIDING** a balanced mix of ~~plant~~ **TREE** varieties ~~according to the 30/20/10 Rule~~. TR 9.1 **FOR ROADWAY, CIVIC, AND LARGE-SCALE PRIVATE DEVELOPMENTS THAT MAY AFFECT OR ALTER THE CONTEXT AREA THROUGH LANDSCAPE DESIGN, CONSIDER APPLYING THE 30/20/10 RULE, WHERE** no more than 30% of plants in a landscape PLAN ~~should~~ belong to the same family, no more than 20% ~~of the plants~~ should belong to the same genus, **AND** no more than 10% ~~of the plants~~ should belong to the same species.	Focus Group	3/24/2026
56	Page 36, TR 9	Allow flexibility for desert-adapted palettes, where species diversity may be inherently limited.	Updated Text Page 36 Tree Diversity TR 9 Prevent monocultures (plantings dominated by a single species or family) by ~~ensuring~~ **PROVIDING** a balanced mix of ~~plant~~ **TREE** varieties ~~according to the 30/20/10 Rule~~. TR 9.1 **FOR ROADWAY, CIVIC, AND LARGE-SCALE PRIVATE DEVELOPMENTS THAT MAY AFFECT OR ALTER THE CONTEXT AREA THROUGH LANDSCAPE DESIGN, CONSIDER APPLYING THE 30/20/10 RULE, WHERE** no more than 30% of plants in a landscape PLAN ~~should~~ belong to the same family, no more than 20% ~~of the plants~~ should belong to the same genus, **AND** no more than 10% ~~of the plants~~ should belong to the same species.	Focus Group	3/24/2026
57	Page 36, TR 9	Balance diversity goals with design intent, including aesthetic considerations (e.g., uniform street tree appearance).	Updated Text Page 36 Tree Diversity TR 9 Prevent monocultures (plantings dominated by a single species or family) by ~~ensuring~~ **PROVIDING** a balanced mix of ~~plant~~ **TREE** varieties ~~according to the 30/20/10 Rule~~. TR 9.1 **FOR ROADWAY, CIVIC, AND LARGE-SCALE PRIVATE DEVELOPMENTS THAT MAY AFFECT OR ALTER THE CONTEXT AREA THROUGH LANDSCAPE DESIGN, CONSIDER APPLYING THE 30/20/10 RULE, WHERE** no more than 30% of plants in a landscape PLAN ~~should~~ belong to the same family, no more than 20% ~~of the plants~~ should belong to the same genus, **AND** no more than 10% ~~of the plants~~ should belong to the same species.	Focus Group	3/24/2026

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58	Page 38, Site Specific Tree List	Mexican Bird of Paradise? or else it could be confused with caesalpinia gilliesii perhaps?	The Guidelines are intended to match the Arizona Department of Water Resources Low Water Use and Drought Tolerant Plant List. Pages 39 and 41 updated to note caesalpinia gilliesii.	Public Comment	4/1/2026
59	Page 41, Tree Guides, Cascolote	What is dictating the distance apart? Doesn't seem to correspond to the other trees and width if this one says only 15' width…	"Distance Apart" within the Tree Guides are intended to ensure canopy overlap. Spacing is generally based on the tree's expected mature canopy spread, adjusted for species form and typical pruning.	Public Comment	4/1/2026
60	Page 44, Tree Guides, Texas Ebony	Missing water graphics.	Texas ebony has been updated to the "Lower" water use category.	Public Comment	
61	Page 45, Tree Guides, Palo Verde	Would this include foothills palo verde?	As noted in the Tree Guide, Parkinsonia spp. means palo verdes generally, rather than one exact species.	Public Comment	4/1/2026
62	Page 45, Tree Guides, Mesquites	Spelling: prosopis	Spelling has been corrected.	Public Comment	4/1/2026
63	Page 46, Tree Guides, Ghost Gum	Swap out for real pic of ghost gum and not google streetview	Photo has been updated.	Public Comment	4/1/2026
64	Page 48, TR 11	Add guidance on when stakes should be removed.	TR 11.8 discusses stake removal.	Focus Group	3/24/2026
65	Page 48, TR 11.7	Spelling: cable	Spelling has been corrected.	Public Comment	4/1/2026
66	Page 51, TR 12	Consider implementing deepwater irrigation practices where feasible (TR13).	TR 12.2 specifically discusses deep root watering methods.	Focus Group	3/24/2026
67	Page 52, Trees	Seasonal guides: Are the bullets supposed to be at the first line of the sentence?	Correct - bullet locations have been corrected.	Public Comment	4/1/2026
68	Page 52, Trees	Seasonal guides: This summer text looks like it's not semibold like the others	Font corrected.	Public Comment	4/1/2026
69	Page 52, Table 1-1	Table 1-1 : Years as well?	"Years" has been deleted from "Growth Stage".	Public Comment	4/1/2026
70	Page 53, Tree Pruning & Maintenance	Excellent plan and so needed. HOA in Ancala CC want to cut all trees back to 20 feet. This leaves most trees with bare branches and no shade. There are many beautiful trees now. Trees have provided much needed shade to many homes. Can City of Scottsdale help implement the Tree Plan to help save the trees in Ancala Country Club? March 24 is the big meeting on this at the Ancala CC meeting room. Thank you.	TR 14 through TR 16 outline pruning practices intended to support long-term tree health, canopy structure, and shade performance. The Shade & Tree Plan for the Built Environment is still in draft form and has not been adopted. Further, the plan is intended as design guidance and is not a regulatory document. Ancala Country Club is a private HOA community governed by its own CC&Rs and maintenance practices, which are not administered by the City.	Online Public Comment	3/10/2026
71	Page 53, Benefits of Pruning	Are we sure about using the term "thinning", it always seems to be a charged word from landscapers, and reduction seems to be taking it's place, can we get buy off from an arborist on this one or have we done that already? I guess my main worry is that crown thinning turns into lion tailing :(especially at my office	The draft guidlines notes crown reduction and crown thinning as two different pruning methods. TR 16.3 is about reducing tree height and/or spread where there are conflicts, while TR 16.4 is about selectively removing live branches to reduce crown density. Replacing "thinning" with "reduction" would blur two distinct practices.	Public Comment	4/1/2026
72	Page 54, TR 14	Place greater emphasis on preservation of mature trees within development standards.	Page 30 includes inset text that discusses the importance of protecting mature trees. TR 14.7 specifically discusses avoiding relocating or removing mature trees.	Focus Group	3/24/2026
73	Page 56, Figure 1-14	Slightly adjust arrow to cut, per 1 and 2	Arrow location corrected.	Public Comment	4/1/2026

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Water Harvesting Guidelines					
74	Water Harvesting, General	This section seems technically excellent. I would like to see the City do more to encourage permeable pavement, stormwater capture, and residential cisterns -- and I will vote in favor of such proposals. I believe we are in an "all tools on the table" moment regarding water.	The Plan as drafted encourages permeable pavement, stormwater capture, and, where appropriate, cistern-based water harvesting as part of its broader GSI and water-harvesting framework. This comment is understood as support for continued implementation of those strategies and consideration of broader future application.	Online Public Comment	4/9/2026
75	Water Harvesting, General	Coordinate early in the design process, particularly with civil engineers, to improve feasibility.	The city provides the opportunity for applicants to coordinate early on proposals via pre-apps.	Focus Group	3/24/2026
76	Water Harvesting, General	Avoid a one-size-fits-all requirement; tailor approaches based on context (urban vs. suburban).	The guidelines, as drafted, are not intended as a one-size-fits-all approach.	Focus Group	3/24/2026
77	Water Harvesting, General	Consider offering a menu of compliance options (similar to City of Phoenix LID approach) rather than a single mandate.	The guidelines specific to Water Harvesting include several GSI examples and are not intended as one-size-fits-all.	Focus Group	3/24/2026
78	Water Harvesting, General	Explore incentive-based strategies, such as parking reductions, to encourage implementation.	Incentive based strategies - such as reduced parking requiements - would necessitate a regulatory update.	Focus Group	3/24/2026
79	Water Harvesting, General	Integrate requirements earlier in the entitlement process (e.g., zoning or site planning stages).	Future implementation of the guidelines could include updates to the zoning ordinance.	Focus Group	3/24/2026
80	Water Harvesting, General	Provide clear examples and visual guidance, including sample site plans and "preferred vs. discouraged" approaches.	The guidelines, as drafted, include a variety of design scenarios.	Focus Group	3/24/2026
81	Water Harvesting, General	Recognize that implementation is more feasible in certain contexts (e.g., roadways vs. parking lots).	The guidelines, as drafted, are not intended as a one-size-fits-all approach.	Focus Group	3/24/2026
82	Page 58, Gray Water	Refer to greywater comment previously	Both spellings are acceptable. Scottsdale Water prefers this spelling. It also aligns with ADEQ and state statute.	Public Comment	4/1/2026
83	Page 59, Photograph	Photo: Curb *opening* since it wasn't cut, but poured that way.We can provide updated pic of this.	"Curb cut" is still appropriate here. In the draft guidelines, the term is used functionally to describe an opening in the curb that conveys runoff into an adjacent GSI feature, whether created as part of new construction or added later as a retrofit.	Public Comment	4/1/2026
84	Page 61, Photograph	Photo: Do we need to add the photo credits as well as the projects they are from?	The consultant team is credited at the beginning of the plan and provided the photography used throughout the document. The consultant is responsible for securing appropriate usage rights for all images. As such, staff does not propose adding individual photo credits to each image. Photo captions are intended to describe the content of the image and its relevance to the guidance, rather than to provide attribution.	Public Comment	4/1/2026
85	Page 66, Permeable Pavement Exhibit	Graphics: Graphic isn't matching up with call-outs, switch out correct graphic showing pavedrain. Permeable block rather than porous concrete. Use our pic from flood control district pavedrain in place of "permeable interlocking concrete pavers" image.	Exhibit corrected.	Public Comment	4/1/2026
86	Page 68, Suspended Pavement Exhibit	Suspended Pavement: Going back to my earlier comment about the soil cells, since here we're calling out suspended pavement, so just want things to match	"Suspended Pavement" is now utilized throughout the document, where "soil cells" is a type or component within a suspended pavement system. Updated Text Page 35, Supporting guideline TR 7.2 ~~**Soil cells**~~**SUSPENDED PAVEMENT** may be utilized in hardscaped areas or areas where 1,000 CF of soil volume cannot be achieved. Page 35, Inset text heading **SUSPENDED PAVEMENT**: SOIL CELLS Page 68, Suspended Pavement description Suspended pavement systems, **SUCH AS SOIL CELLS,** support sidewalks, plazas, or parking areas on a structural deck or frame so that soil beneath remains largely uncompacted and usable for tree roots and stormwater infiltration. They often work with structural soils ~~**or soil cell systems**~~ to provide both loading capacity and high-quality rooting volume. Page 110, Soil Cell Glossary Term deleted, added Suspended Pavement term **SUSPENDED PAVEMENT – A PAVEMENT-SUPPORT SYSTEM THAT CARRIES SIDEWALKS, PLAZAS, OR PARKING AREAS ON A STRUCTURAL DECK, FRAME, OR CELL SYSTEM SO THAT SOIL BENEATH REMAINS LARGELY UNCOMPACTED AND USABLE FOR TREE ROOTS AND STORMWATER INFILTRATION.**	Public Comment	4/1/2026
87	Page 69, Structural Soil Exhibit	Graphic: 24" rather than 24' Minimum Depth Structural Soil	Exhibit corrected.	Public Comment	4/1/2026
88	Page 74, Above Ground Cistern Exhibit	Graphic: Extend arrow of "Roof Gutter Downspout w/ Leaf Eater" to leaf eater	Exhibit corrected.	Public Comment	4/1/2026
89	Page 75, Below Ground Cistern Exhibit	Graphic: Exten arrow of "Roof Gutter Downspout w/ Leaf Eater" to leaf eater	Exhibit corrected.	Public Comment	4/1/2026

Comment	Applicable Page/Goal/Policy/Section	Public Outreach Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
Shade Structure Guidelines					
90	Page 79, SS 2	Consider requiring shade coverage calculations (SS2).	Page 25, Advancing Citywide Shade Goals: **DESIRED** Shade Canopy Coverage A key focus of the Scottsdale Shade & Tree Plan for the Built Environment document is expanding citywide shade. The categories below identify high-priority locations with corresponding long-term shade goals. The ranges provided are planning targets—not mandatory, minimum requirements—and may **HELP INFORM HOW SHADE PERFORMANCE IS EVALUATED AND COMMUNICATED THROUGH SITE PLANS AND RELATED PROJECT MATERIALS**, based on site context, constraints, and project type.	Focus Group	3/24/2026
91	Page 79, SS 2	In residential contexts, focus shade requirements on shared/open space pathways, rather than individual residential frontages.	The Shade & Tree Plan is intended to provide design guidance. Scottsdale does not regulate landscape design for individual single-family residential properties, with the exception of requirements related to the location of non-native plants, the location of artificial turf, and the revegetation of natural areas open space within the Environmentally Sensitive Lands Overlay District.	Focus Group	3/24/2026
92	Page 79, SS 2	Account for site constraints such as utilities, driveways, and solid waste access.	The Zoning Ordinance and Design Standards & Policies Manual cover standards and requirements for structures and their adjacency to such site constraints.	Focus Group	3/24/2026
93	Page 82, SS 3	Define “continuous shade network” with a clear, achievable metric (e.g., 50%, 75%). Consider 50% shade coverage as a more realistic baseline target. Avoid applying high coverage requirements (e.g., 75%) uniformly, particularly in residential contexts.	The phrase continuous shade network was not intended as a defined shade metric, but moreso represent shaded areas. Updated Text Page 21, Collaborat on Shade Foster partnerships and shared responsibility to sustain and expand ~~the~~ shade ~~network~~. Objectives emphasize education, community awareness, interdepartmental coordination, and participation through private developments, volunteers, and neighborhood-led efforts Page 78, Shade Canopy Balance The most effective shade ~~networks~~ **DESIGNS** layer tree canopy and shade structures to maintain coverage consistency throughout the day and across seasons. Page 82, Supporting Guideline SS 3.2 Use shade structures to link major pedestrian routes and activity areas—including transit stops, crossings, seating, playgrounds, and building entrances—~~in~~to ~~a~~ **PROVIDE** continuous shade ~~network~~.	Focus Group	3/24/2026
94	Page 84, SS 7	Consider including structures for placemaking and neighborhood identity as stipulations of approval.	The intent of SS7 is to strengthen area placemaking and would be a discussion point during the design review process.	Focus Group	3/24/2026
95	Page 87, SS 13	Defer structural design for wind and monsoon conditions to building code requirements for maintenance/enforcement.	Each structure would be reviewed by city's Building and Engineering staff prior to permit issuance.	Focus Group	3/24/2026
Design Scenarios					
96	Pages 91 - 94, Design Scenarios	Figure 4-4 through Figure 4-9: Silva cells sit on top of base, not through it.	Exhibit corrected.	Public Comment	4/1/2026
Old Town Guidelines					
97	Old Town, General	I strongly support working with existing land owners and developers of future projects on increasing the shade available to pedestrians in the Old Town area.	Noted.	Online Public Comment	4/6/2026
98	Page 103, Old Town Major Streets Palettes	Plan for long-term replacement of problematic tree species (sissoo) within themed corridors.	Staff proposes retaining sissoo as the theme tree on Indian School Road because the existing mature canopy defines the corridor and continues to provide meaningful shade. The Street Tree Palette is intended to balance shade performance with established landscape character, and in this case the continued use of sissoo reflects the importance of preserving both corridor identity and existing shade value. Chinese pistache is included as an accent tree and may provide flexibility for future transition or replacement over time, as appropriate.	Focus Group	3/24/2026
99	Page 103, Old Town Major Streets Palettes	Indian School Road: Theme Tree - Sissoo: Existing, but do we want to continue using these?	Staff proposes retaining sissoo as the theme tree on Indian School Road because the existing mature canopy defines the corridor and continues to provide meaningful shade. The Street Tree Palette is intended to balance shade performance with established landscape character, and in this case the continued use of sissoo reflects the importance of preserving both corridor identity and existing shade value. Chinese pistache is included as an accent tree and may provide flexibility for future transition or replacement over time, as appropriate.	Public Comment	4/1/2026
100	Page 104, OT 2.3	50% shade coverage target in parking lots is a reasonable standard.	Noted.	Focus Group	3/24/2026

Comment	Applicable Goal/Policy/Section	Board or Commission Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
General Comments/Suggestions					
1	General	Regarding the shift towards regulatory language of city guidelines, from an implementation standpoint, is this more used as a guideline that serves to assist development entities, or something that city is trying to regulate? Is there anything here that is regulatory or is this suggestive across the board?	If approved, the guidelines would operate like other Scottsdale design guidelines, acting as a design-oriented framework of practical guidance intended to be applied during the development review process. This document will inform future regulatory updates as a result of HB 2447(2025).	Development Review Board, Comment Received During Regular Meeting Agendized Item	3/5/2026
2	General	Is there some sort of metric where we compare from the best around the valley? Did we compare what is out there with other cities and try to tap into what is best? Best practices? Gilbert size requirements noted. Tree City certification recognized.	A benchmark study of cities within the Phoenix Metropolitan Area was completed, which influenced what was drafted to fit Scottsdale uniquely.	Development Review Board, Comment Received During Regular Meeting Agendized Item	3/5/2026
3	General	Was there progress in cataloging the number of trees in the city?	A number of different processes were carried out in an effort to identify the number of trees in Scottsdale. It is estimated that there are 830,00 trees, but not including the Preserve. iTree among other methodologies were utilized.	Development Review Board, Comment Received During Regular Meeting Agendized Item	3/5/2026
4	General	What are the steps and timeline from approval of this document to regulations via ordinance?	Following adoption, any incorporation into regulatory documents such as the Zoning Ordinance would occur through a future update process, including stakeholder input, refinement, and prioritization, with recommendations reviewed and considered by City Council.	Development Review Board, Comment Received During Regular Meeting Agendized Item	3/5/2026
5	General	Is there a priority order for converting these guidelines to regulations, what the schedule for doing so is, and should some be regulatory now?	Following adoption, any incorporation into regulatory documents such as the Zoning Ordinance would occur through a future update process, including stakeholder input, refinement, and prioritization, with recommendations reviewed and considered by City Council.	Development Review Board, Comment Received During Regular Meeting Agendized Item	3/5/2026
6	General	Once approved, does this document act as a template for future development, or are we using it to fund projects?	The Plan does not guarantee City funding, installation, or maintenance for any specific site, project, or neighborhood. Rather, it serves as a framework to guide future development by providing practical direction for tree selection and placement, integration of water-harvesting practices, and the use of shade structures across a range of site types and contexts. The plan would act as a resource for project scope creation.	Parks and Recreation Commission, Comment Received During Regular Meeting Agendized Item	3/18/2026
7	General	Are the plan's guidelines mandatory requirements for development projects or flexible/optional design guidance?	The Plan is not a regulatory ordinance or replacement for adopted codes, engineering standards, or other City policies. It serves as a strategic, design-oriented framework of practical guidance intended to be applied during the development review process.	Neighborhood Advisory Commission, Comment Received During Regular Meeting Agendized Item	3/25/2026
8	General	Clarification on the adopting body for the plan - specifically whether adoption would occur through City Council or the Development Review Board.	The Development Review Board is the adopting body for this plan per Scottsdale Code Sec. 1902.	Neighborhood Advisory Commission, Comment Received During Regular Meeting Agendized Item	3/25/2026
9	General	Will implementation of the plan include coordination with SRP's residential tree program? There may be a possible conflict with this program and the City's existing turf removal efforts.	Scottsdale City Charter places limitations on the provision of public funds to individual private property owners. Utility-sponsored tree distribution programs can be a valuable tool for expanding residential canopy. Such programs are typically established and administered by the utility provider based on its own funding, service territory, operational priorities, and program criteria. While utility-sponsored programs are not identified as an implementation item of the draft Shade & Tree Plan, trees planted through such programs on residential properties could voluntarily apply the Plan's guidance related to tree placement, species selection, water efficiency, and long-term health. In addition, a future residential-focused idea book will be developed to provide homeowners with practical shade, tree, and water-harvesting concepts.	Neighborhood Advisory Commission, Comment Received During Regular Meeting Agendized Item	3/25/2026
10	General	Expressed strong appreciation for the plan and staff's work, noting that the document is proactive, forward-looking, and reflects thoughtful planning for the community.	Noted.	Neighborhood Advisory Commission, Comment Received During Regular Meeting Agendized Item	3/25/2026
11	General	Who is the target audience of this document—city staff, the public, or others?	The Plan is intended to serve multiple audiences, citizens, applicants, developers, design professionals, and city Boards, Commissions, and Staff involved in project planning and review. It is a public-facing guidance document that guides tree and shade selection, placement, and maintenance.	Scottsdale Environmental Advisory Commission, Comment Received During Regular Meeting Agendized Item	4/15/2026
12	General	How does Parks and Recreation fit into this? Do they have separate standards, or does this apply to them as well?	Parks and Recreation was involved in development of the Plan, and the Plan is intended to apply citywide, including future park improvements. Routine operational practices may still be guided by department-specific procedures, but the Plan is intended to support Parks' broader approach to tree and shade planning and implementation.	Scottsdale Environmental Advisory Commission, Comment Received During Regular Meeting Agendized Item	4/15/2026

Comment	Applicable Goal/Policy/Section	Board or Commission Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
13	General	What does incremental implementation mean, especially without targets? It is not clear that this is intended to be a reference document.	Incremental implementation means the Plan would be applied over time as projects are proposed, reviewed, and implemented, rather than through a single citywide action. The Plan is intended to function as the foundation for tree and shade implementation tools including ordinances, budget funding, and voluntary actions to improve shade outcomes over time.	Scottsdale Environmental Advisory Commission, Comment Received During Regular Meeting Agendized Item	4/15/2026
14	General	How does this help existing areas with little or no development, such as parts of south Scottsdale identified as particularly hot?	The Plan is intended to apply citywide and provide consistent shade guidance regardless of location. In areas with limited development activity, implementation may occur more gradually as opportunities arise.	Scottsdale Environmental Advisory Commission, Comment Received During Regular Meeting Agendized Item	4/15/2026
15	General	Are you suggesting what residents should be planting?	The Plan includes recommended tree lists and water-harvesting concepts that may be informative to residents, and a separate residential idea guide will be developed as an implementation tool to help translate these ideas for homeowner use.	Scottsdale Environmental Advisory Commission, Comment Received During Regular Meeting Agendized Item	4/15/2026
16	General	The document does not appear to address heat issues and reads more like an architectural or infrastructure guide than a true shade and tree plan. A major issue is the city putting down black tar which creates the hottest surface temperatures.	The Plan addresses heat through tree and shade infrastructure and related cooling strategies, but it is not intended to function as a pavement or roadway materials document. Comments regarding asphalt surfacing are more appropriately considered through other City plans and programs.	Scottsdale Environmental Advisory Commission, Comment Received During Regular Meeting Agendized Item	4/15/2026
17	General	The document seems to be a design guide for future projects rather than a set of goals or instructions on how to mitigate current issues with respect to heat, air quality, and health. I still feel like we are missing an actual plan.	The document is structured as citywide design guidance for the built environment, and is not a climate-action plan. Its purpose is to provide best practices for incorporating shade, trees, and water-harvesting strategies into future public and private development over time.	Scottsdale Environmental Advisory Commission, Comment Received During Regular Meeting Agendized Item	4/15/2026
18	General	I understand the limitations for residential private property owners. You can't tell them what to do, you can only advise them. I was expecting measurable goals and targets, especially given the climate emergency and water crisis. There are opportunities in areas the City can control.	The Plan is structured as citywide design guidance, particularly in areas where the city has more direct control. It is intended to provide a consistent framework for incorporating shade, trees, and water-harvesting strategies into future public and private development over time. A separate residential idea guide will be developed in the future to encourage residential private property owners to participate.	Scottsdale Environmental Advisory Commission, Comment Received During Regular Meeting Agendized Item	4/15/2026
19	General	There are no targets and no clear baseline from which we start "increasing" shade. The Plan missed an opportunity to address complex, interrelated issues around heat, water, and air quality.	A baseline exists, developed using LiDAR, iTree analysis, and field verification. It informed the Plan's existing conditions analysis and shade coverage mapping. Numerical targets were not included, as the Plan prioritizes appropriate design, tree selection, placement, and long-term performance over quantity.	Scottsdale Environmental Advisory Commission, Comment Received During Regular Meeting Agendized Item	4/15/2026
20	General	Is the data from the Cooler Scottsdale study, or is there newer data?	Data was collected using LiDAR (primarily 2023–2024), iTree analysis, and a large field study documenting nearly 19,000 trees.	Scottsdale Environmental Advisory Commission, Comment Received During Regular Meeting Agendized Item	4/15/2026
21	General	Why is the data not being used to establish goals or a more comprehensive plan? Why is this a reference guide rather than a true shade and tree plan?	The Plan uses baseline conditions and available data to inform consistent project-level guidance for trees, shade structures, and water-harvesting strategies over time, while allowing flexibility for varying site conditions across Scottsdale. Implementation is intended to occur incrementally as projects are proposed, reviewed, and implemented, helping advance more consistent shade outcomes citywide.	Scottsdale Environmental Advisory Commission, Comment Received During Regular Meeting Agendized Item	4/15/2026
22	General	Other cities with similar conditions have plans with defined goals, timelines, and implementation strategies. While a design concept is definitely necessary, I think you can marry that with an actual plan on how to do this step by step.	This document is focused on citywide design and implementation guidance for the built environment, rather than a phased action plan with fixed goals and timelines. Implementation is intended to occur incrementally as projects are proposed, reviewed, and implemented, helping advance more consistent shade outcomes citywide. Similar to other city infrastructure such as transportation improvements.	Scottsdale Environmental Advisory Commission, Comment Received During Regular Meeting Agendized Item	4/15/2026
23	General	It's a missed opportunity to just look at new development in this plan, in particular new commercial development and not looking at existing areas.	The Plan is not limited to new development. Although new development presents the clearest and most measurable opportunity for implementation, the Plan is also intended to guide shade-related improvements to existing areas over time through public and private redevelopment and other improvement opportunities as they arise.	Scottsdale Environmental Advisory Commission, Comment Received During Regular Meeting Agendized Item	4/15/2026
24	General	1. no implementation framework to include timelines, funding strategies, assigned responsibilities, or enforcement mechanisms.	The Plan is structured as citywide design and implementation guidance for the built environment, rather than a standalone capital program or regulatory implementation document. Implementation is intended to occur incrementally through public and private development, redevelopment, and related improvement efforts over time; accordingly, the document does not include a separate citywide timeline, funding program, assignment matrix, or standalone enforcement section. Future implementation programs and regulatory tools will build upon this guidance.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/17/2026
25	General	2. no baseline data, benchmarks, or reporting requirements noted in the report (despite being told there were data assessments used to develop the guide).	Baseline data and benchmarking informed development of the Plan, its existing conditions work, and recommendations.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/17/2026

Comment	Applicable Goal/Policy/Section	Board or Commission Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
26	General	3. the plan is very repetitive regarding general benefits and concepts without a concrete strategy to reach "goals".	The Plan is organized around integrated guidance for trees, shade structures, and water harvesting, as such, some general concepts and benefits recur across sections to reinforce how those systems work together. That repetition is intended to reinforce how the three systems work together rather than operate independently.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/17/2026
27	General	5. not tied to economic factors or benefits (mentioned but not quantified).	The Plan acknowledges that shade infrastructure provides economic and related community benefits. However, consistent with other City design guideline documents, it is structured as a design and implementation tool rather than a quantified economic analysis. As a result, generalized economic benefits are noted, but not measured in detail within the document.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/17/2026
28	General	6. no mention of community stewardship or ownership.	The Plan is structured as a citywide design guidance document, its primary focus is on physical design, site planning, and long-term shade performance rather than on community stewardship programs or ownership models. The document's broader goals and objectives recognize the importance of coordination and shared effort in expanding and maintaining shade infrastructure over time.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/17/2026
29	General	7. not grounded in Scottsdale specific data or criteria.	The Plan was informed by local shade and canopy assessment work, Scottsdale's desert climate and heat conditions, local rainfall and runoff considerations, and Scottsdale-specific tree, streetscape, and character-area conditions. The resulting guidelines are tailored to local conditions, including Character Area specific guidance such as Old Town tree palette.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/17/2026
30	General	8. claims to implement the general plan but lacks execution mechanisms.	The Plan implements relevant General Plan goals and objectives through cross-referenced design guidance rather than through a separate target-based action program. As a citywide design guidance document, it is intended to be applied incrementally through project planning, review, and implementation over time. While it does not establish standalone execution mechanisms such as fixed timelines or numerical targets, its consistent use across public and private development, and related improvements is intended to support more consistent shade outcomes citywide.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/17/2026
31	General	9. no maintenance or lifecycle strategy.	The Plan includes maintenance and lifecycle considerations throughout. Tree (pages 53 - 56), Water Harvesting (page 65), and Shade Structure (pages 85 - 87) sections each address long-term performance, including maintenance, durability, and longevity.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/17/2026
32	General	10. overall the plan misses a critical opportunity to address the interconnected challenges facing our city and state - worsening extreme heat, declining air quality, water crisis, and associated public health impacts - thus failing to reflect the complexity or urgency of these issues.	The Plan addresses these issues through integrated design guidance for shade, tree canopy, and water harvesting in Scottsdale's built environment. However, it is not intended to serve as a comprehensive climate, air quality, water policy, or public health action plan; rather, it provides a practical framework for improving shade and resilience incrementally through project planning and implementation over time.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/17/2026
33	General	As a member of SEAC, I am writing to you regarding the Shade and Tree Plan. The introduction portion of the document highlights all the reasons we need an actual plan but the remainder of the current proposal is nothing more than a design schematic that is woefully inadequate to handle the current extreme heat. And as was mentioned during the presentation to our commission, this is not an actual plan; there are no goals, no mandates and no suggestions even for what to do with existing structures. It is basically a design concept for new builds which the developers can choose to ignore as there are no consequences nor incentives to follow what is proposed. The citizens of this city deserve more and burying our heads in the sand will not make our air quality, heat index, and rising health issues disappear.	The Plan is structured as citywide design and implementation guidance for the built environment, rather than a high-level action plan. It is intended to inform public and private development, and related improvements over time to support more consistent shade outcomes across Scottsdale.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026
34	General	A) This plan doesn't help further the goals set out in the General Plan and in many ways has a negative impact on the General Plan. For example, not setting - and meeting - measurable goals to reduce excessive heat, increase air quality, increase livability will negatively impact the tourism of Scottsdale.	The draft Shade & Tree Plan is consistent with and helps implement multiple elements of the Scottsdale General Plan 2035, including Character & Design, Open Space, Environmental Planning, Recreation, Cost of Development, Community Involvement, and Public Services & Facilities. The Plan advances these General Plan elements by establishing guidance for shade, tree placement, soil volume, tree health, water harvesting, pedestrian comfort, parking lot shade, streetscape design, and heat-resilient public and private spaces. While the Plan does not rely on a single citywide canopy target, it provides a more targeted framework for improving effective shade where people walk, gather, recreate, and access services. In this way, the Plan supports broader General Plan goals related to livability, environmental quality, public comfort, and Scottsdale's continued attractiveness as a destination community.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026

Comment	Applicable Goal/Policy/Section	Board or Commission Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
35	General	B) Need a mission statement For example, Gilbert's Shade & Streetscape Master Plan's is Building A Healthier, More Livable Community Through Strategic Investment in Maintenance and Growth of the Urban Forest and Engineered Shade	As drafted, the Plan includes a Mission Statement, Vision Statement, and Goals (pages 20 - 24) in the introductory portion of the document, serving as the impetus for the guidelines. The Mission Statement, in particular, focuses on creating cooler environments where shade integrates with Scottsdale's desert landscape.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026
36	General	C) Add goals and measurements that can be tracked. For example, "Shade Phoenix is a data-driven plan, leveraging detailed analysis of citywide tree and shade data across City-owned, public, and private properties. At the census tract scale, tree canopy cover varies from 2% to 30%. The median census tract has 11% tree canopy. The plan includes findings from the City's first shade analysis, which estimates the combined impact of shade from both built and natural sources. The Plan includes 36 actions across four strategy areas, addressing 11 strategic priorities. Collectively, these actions represent more than $60 million in allocated funding over the next five years and will result in more than 27,000 new trees and 550 new shade structures. This represents an almost doubling of the number of trees planted annually by the City of Phoenix. More than 50% of the total investment will be made in low- to moderate-income communities and 85% will be made in low-moderateand middle-income communities." (Page 9) *People's experiences in the Phoenix of the future will be influenced by how successfully our community maintains and expands publicly available shade, because shade is one of the most effective strategies to make hot outdoor urban environments safe and comfortable.	The Plan's primary purpose is to establish standards, priorities, and best practices that can be applied consistently over time through development review of public and private development. The Phoenix example cited is structured differently than the intent of this Plan. The Phoenix Shade Plan includes specific actions tied to identified funding sources such as city budgeting, bond funding, and federal funding programs. While that approach may be appropriate for Phoenix's implementation framework, it is not directly comparable to Scottsdale's draft Plan. Funding tied to specific actions or programs may support near-term implementation, but may not provide the same level of consistent, long-term applicability across the wide range of public and private projects that shape the built environment. Scottsdale's draft Plan provides a practical and implementable framework for improving shade outcomes over time, while allowing future funding, capital projects, partnerships, and development activity to inform specific implementation measures.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026
37	General	D) Add a goal of % of canopy coverage. Tucson's canopy coverage is 15% and then they are prioritizing it in areas with disparities where it is harder for people to buy, plant and care for trees. *Celebrate and acknowledge Scottsdale's current 13% of shade coverage (12.4% is provided by trees and 0.6% by shade structures) vs the national average. But know that there's a long way to go to make residents healthier and more comfortable in our increasingly hot climate.	The Plan does not establish a single citywide canopy percentage goal as the primary measure of success. While canopy coverage is a useful broad indicator, it does not, by itself, show whether shade is being provided where it is most needed, whether trees are properly placed and supported for long-term health, or whether pedestrian comfort is being meaningfully improved. A citywide percentage goal can also be difficult to use as a reliable implementation measure because shade coverage changes over time due to redevelopment, private property decisions, tree removals and plantings, storm damage, tree mortality, and natural growth cycles. Many of these factors occur outside the direct control of the City. The Plan recognizes Scottsdale's existing shade coverage, including both tree canopy and shade structures, and focuses on preserving and enhancing those assets through project-level guidance. Rather than relying on an aggregate citywide percentage, the Plan emphasizes strategic placement, tree survivability, soil volume, maintenance practices, pedestrian environments, parking areas, public spaces, and redevelopment opportunities so shade improvements can be directed where they provide the greatest functional benefit. The Plan includes desired percentage of shade as ranges for particular types of development opportunities (page 25). These ranges are not intended as citywide canopy targets, but as best practices for addressing shade as infrastructure within the built environment.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026
38	General	E) Prioritize some of the hottest areas to mitigate heat - the airpark, old town, south scottsdale… (p 10 of the Scottsdale Shade Plan)	Heat conditions, development patterns, and shade opportunities vary across Scottsdale, and some areas of the city may warrant particular attention based on land use intensity, pedestrian activity, existing shade conditions, and concentrations of hardscape. As such, the Plan is structured to allow implementation to respond to context and need over time. The Plan includes an Old Town-specific tree planting palette and guidelines; however, those provisions are primarily intended to support Old Town's established design character and streetscape context while still advancing the broader citywide shade guidance. Citywide guidance can be applied through future development review, capital improvements, streetscape projects, and redevelopment efforts.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026

Comment	Applicable Goal/Policy/Section	Board or Commission Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
39	General	F) Compare our plan to other cities in the valley i) City of Glendale measured Quality of Life, Effects on Climate and Budget - Electricity and natural gas savings annually, Annual net air pollutant uptake by tree foliage, greenhouse gas carbon dioxide sequestered, etc… (p. vii, City of Glendale, Arizona Municipal Forest Resource Analysis https://www.fs.usda.gov/psw/topics/urban_forestry/products/cufr579GlendaleBCAFinal.pdf) ii) Gilbert's Shade and Tree Plan https://www.gilbertaz.gov/departments/parks-and-recreation/parks/park-plans-andreports/ shade-and-streetscape iii) In 2024 the City of Phoenix launched the updated and expanded 'City of Phoenix 2024 tree and shade master plan: Shade Phoenix', building on the plan from 2010. Phoenix involved many departments within the city as well as Environmental Quality and Sustainability Commission and all 15 Village Planning Committees in the formation of their plan. iv) Arizona Department of Forestry and Fire Management's 2017 Shade Tree Planting Prioritization https://dffm.az.gov/resources/2017-shade-tree-planting-prioritization	In preparing the draft Plan, staff reviewed regional shade, tree, and urban forestry planning efforts to help inform guidance tailored to Scottsdale's built environment. While comparisons to other jurisdictions can be informative, plans adopted by other cities are often structured around different municipal responsibilities, budgets, staffing models, urban form, tree inventories, utility systems, and implementation programs. As a result, direct comparisons do not always translate into approaches that are appropriate or transferable to Scottsdale. Accordingly, the Plan focuses on guidance related to tree placement, soil volume, shade structures, water harvesting, pedestrian comfort, redevelopment, and long-term shade performance within Scottsdale's specific context.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026
40	General	H) Leverage other departments and studies: City of Scottsdale's Office of Environmental Initiatives Heat Mitigation Plan, Cooler Scottsdale study, etc	The Plan was prepared with consideration of related City efforts and background materials, including the Identifying Strategies for a Cooler Scottsdale study. However, the City does not currently have an adopted Heat Mitigation Plan.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026
41	General	I) Need goals concerning engaging public and working with non-profits (Increase Local, Regional, and National Partners) Partner with organizations - both in the tree and shade programs that the City operates or supports, and/or have them provide input into the content of the plan (See p. 5 of Shade Phoenix) For example, Trees Matter.org partners with SRP https://www.treesmatter.org/SRP https://www.srpnet.com/energy-savings-rebates/home/shade-tree-workshop	The Plan recognizes that successful shade and tree outcomes often involve collaboration among the City, residents, businesses, utilities, community organizations, and other partners (Page 24). The Plan itself is focused primarily on establishing guidance for the built environment rather than creating standalone programming or partnership agreements. However, its implementation may be advanced over time through partnerships involving tree planting, education, maintenance assistance, water conservation, public outreach, grants, and shade-related initiatives.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026

Comment	Applicable Goal/Policy/Section	Board or Commission Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
42	General	J) Add a goal wherein the utilities provide free trees to residents.	Utility-sponsored tree distribution programs can be a valuable tool for expanding residential canopy. Such programs are typically established and administered by the utility provider based on its own funding, service territory, operational priorities, and program criteria. The draft Shade & Tree Plan is focused primarily on site design and built-environment guidance and does not establish a requirement that utilities provide free trees to residents. Scottsdale City Charter places limitations on the provision of public funds to individual private property owners. While utility-sponsored programs are not identified as an implementation item of the draft Shade & Tree Plan, trees planted through such programs on residential properties could voluntarily apply the Plan's guidance related to tree placement, species selection, water efficiency, and long-term health. In addition, a future residential-focused idea book will be developed in a subsequent phase to provide homeowners with practical shade, tree, and water-harvesting concepts.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026
43	General	L) Add a goal for unnecessary turf removal and replacing with tree canopy	The Plan is not structured as a turf-removal or landscape conversion program. Whether turf is appropriate or unnecessary can depend on site use, recreational function, drainage, maintenance needs, and property context. Where turf areas are underutilized, ornamental in nature, or part of redevelopment efforts, there may be opportunities to incorporate additional tree canopy; however, those decisions are best evaluated based on site-specific conditions and applicable review processes rather than through a universal removal requirement.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026
44	General	N) Maintenance planning should be a part of the tree planning.	Maintenance planning is an important component of the draft Shade & Tree Plan and is incorporated throughout the document as part of long-term performance and lifecycle considerations. Tree (pages 53 - 56), Water Harvesting (page 65), and Shade Structure (pages 85 - 87) sections each address long-term performance, including maintenance, durability, and longevity.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026

Comment	Applicable Goal/Policy/Section	Board or Commission Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
			Introduction		
45	Page 11, Shade Map	Scottsdale has 13% or so shade coverage currently, do we have a number we are ultimately trying to get to?	The Plan does not establish a single citywide canopy percentage goal as the primary measure of success. While canopy coverage is a useful broad indicator, it does not, by itself, show whether shade is being provided where it is most needed, whether trees are properly placed and supported for long-term health, or whether pedestrian comfort is being meaningfully improved. A citywide percentage goal can also be difficult to use as a reliable implementation measure because shade coverage changes over time due to redevelopment, private property decisions, tree removals and plantings, storm damage, tree mortality, and natural growth cycles. Many of these factors occur outside the direct control of the City. The Plan recognizes Scottsdale's existing shade coverage, including both tree canopy and shade structures, and focuses on preserving and enhancing those assets through project-level guidance. Rather than relying on an aggregate citywide percentage, the Plan emphasizes strategic placement, tree survivability, soil volume, maintenance practices, pedestrian environments, parking areas, public spaces, and redevelopment opportunities so shade improvements can be directed where they provide the greatest functional benefit. The Plan includes desired percentage of shade as ranges for particular types of development opportunities (page 25). These ranges are not intended as citywide canopy targets, but as best practices for addressing shade as infrastructure within the built environment.	Parks and Recreation Commission, Comment Received During Regular Meeting Agendized Item	3/18/2026
46	General, Page 25	Were any targets set in this plan? It seems this would make it easier for us to achieve these goals rather than just set them, so I like that.	The Plan does not establish a single citywide canopy percentage goal as the primary measure of success. While canopy coverage is a useful broad indicator, it does not, by itself, show whether shade is being provided where it is most needed, whether trees are properly placed and supported for long-term health, or whether pedestrian comfort is being meaningfully improved. A citywide percentage goal can also be difficult to use as a reliable implementation measure because shade coverage changes over time due to redevelopment, private property decisions, tree removals and plantings, storm damage, tree mortality, and natural growth cycles. Many of these factors occur outside the direct control of the City. The Plan recognizes Scottsdale's existing shade coverage, including both tree canopy and shade structures, and focuses on preserving and enhancing those assets through project-level guidance. Rather than relying on an aggregate citywide percentage, the Plan emphasizes strategic placement, tree survivability, soil volume, maintenance practices, pedestrian environments, parking areas, public spaces, and redevelopment opportunities so shade improvements can be directed where they provide the greatest functional benefit. The Plan includes desired percentage of shade as ranges for particular types of development opportunities (page 25). These ranges are not intended as citywide canopy targets, but as best practices for addressing shade as infrastructure within the built environment.	Development Review Board, Comment Received During Regular Meeting Agendized Item	3/5/2026

Comment	Applicable Goal/Policy/Section	Board or Commission Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
Tree Guidelines					
47	General	Do we have data regarding trees and water use? Some kind of data showing the benefits of trees in relation to the but "trees take water" position?	This topic was reviewed as background during plan drafting; however, that data was not included in the final document because it often focused on trees versus turf, which is not the central prupose of this plan. Instead, the plan emphasizes low-water-use, desert-adapted trees, efficient irrigation practices, and water-harvesting strategies that help support tree health while reducing reliance on potable water. The document approaches trees not as a simple water-use tradeoff, but as part of an integrated shade and landscape system.	Development Review Board, Comment Received During Regular Meeting Agendized Item	3/5/2026
48	General	What is the lifespan of the average tree in Scottsdale?	Urban trees in Scottsdale typically have a functional lifespan of 20 to 50 years, depending on species selection, site conditions, and long-term maintenance.	Parks and Recreation Commission, Comment Received During Regular Meeting Agendized Item	3/18/2026
49	General	We should ensure trees aren't susceptible to falling during a storm.	The Plan promotes proper selection, installation, and maintenance to support healthy, structurally sound trees. While storm-related failure cannot be entirely prevented, these practices reduce overall risk.	Parks and Recreation Commission, Comment Received During Regular Meeting Agendized Item	3/18/2026
50	General, Tree Guidelines, Pages 31-35	4. unnecessary focus on tree planting rather than long term outcomes.	The Plan is focused on both maintaining existing shade and increasing shade over time. Guidance related to tree planting, including location, spacing, soil volume, water access, and species selection, is included because those factors establish the foundation for healthy growth, canopy development, and long-term tree performance. The planting-related guidance is not separate from long-term outcomes; it is intended to support them.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/17/2026
51	General, Pages 34 - 35	Is there information regarding soil prep expectations for tree planting? We need to promote lasting, mature trees--particularly concerning below grade conditions.	Yes, there are guidelines specific to soil volume and quality - pages 34 and 35 of the Plan.	Development Review Board, Comment Received During Regular Meeting Agendized Item	3/5/2026
52	General, Page 37	Are there restrictions/considerations on tree type/size within the Airport area? For example, planting a tall eucalyptus near the runway area.	Developments within the Airport Influence Area must comply with the Scottsdale Revised Code, Chapter 5 – Aviation and the Airpark Rules and Regulations, which includes a height analysis and taxilane access review. Further, supporting guideline TR 10.3 on page 37 discusses selecting trees based on operational constraints and the area's setting - in particular, it mentions the Scottsdale Airpark.	Parks and Recreation Commission, Comment Received During Regular Meeting Agendized Item	3/18/2026
53	Tree Selection Guide, Pages 39-47	G) Remove non-native trees. Get rid of the palm trees, they are water hogs without providing much shade plus they need a lot of maintenance. — the native velvet mesquite supports 60+ pollinator species vs. 6 for the South American hybrid most commonly planted instead. See Tucson's list Appendix A of their plan.	The Plan prioritizes native and desert-adapted trees that support shade, water efficiency, long-term health, and compatibility with Scottsdale's climate. However, staff does not recommend removing all non-native trees from the Plan, as some non-native or desert-adapted species may be appropriate in specific built-environment conditions where space, utilities, visibility, maintenance, or design context limit tree selection. Palm trees are included within the limited Old Town palette contexts where they reflect existing streetscape character, resort-style identity, or historic design patterns. They are not relied upon as primary shade trees and should be paired with higher-performing shade trees where shade coverage is the objective. The Plan's approach is to guide tree selection based on site conditions, water use, canopy performance, maintenance considerations, and context, rather than using a native-only standard that may not be appropriate for every urban condition in Scottsdale.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026

Comment	Applicable Goal/Policy/Section	Board or Commission Comment/Suggestion/Legislative Edits	Staff Response	Comment Source	Date
Water Harvesting Guidelines					
54	General, Water Harvesting Pages 57-75	K) Add more Rainwater Harvesting guidelines: 1. Lower all non-paved landscape areas below adjacent paved surfaces — every inch of unpaved ground becomes free flood control and free irrigation 2. Extend harvesting to public rights-of-way adjacent to commercial properties, converting gravel solar ovens into linear native plant corridors 3. Incentivize shade tree canopy coverage, not just low-growing understory plants 4. Expand to currently excluded sites: parking lots, cemeteries, schools, faith communities, golf courses, parks 5. Expand to residential development	1. Lowering landscape areas below adjacent paved surfaces may be an appropriate rainwater harvesting strategy depending on grading, drainage, accessibility, and site design conditions. The current draft Plan does not preclude that approach where feasible. 2. The Plan is intended to inform both private development projects and City capital improvements. Depending on project context and applicable engineering standards, implementation opportunities may include areas within or adjacent to the public right-of-way. 3. The Plan is not an incentive-based program. Any future incentives tied to canopy coverage, water harvesting, or similar features would require separate policy or ordinance consideration. Staff will note this comment for any future code or policy discussions. 4. The Plan is not structured around excluding specific land uses. New development and redevelopment projects, whether commercial, institutional, civic, or other applicable project types, may utilize and be reviewed against the Plan. 5. Scottsdale does not regulate site design for single-family residential properties. Homeowners can voluntarily apply relevant guidelines where helpful. In addition, a future residential-focused idea book is anticipated to provide homeowners with practical shade, tree, and water-harvesting concepts.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026
55	General, Water Harvesting Pages 57-75	M) Add a goal for amount of stormwater infiltrated in basins. This is an easy calculation based upon the size of the basins and annual rainfall.	Increasing stormwater capture and beneficial use is an important objective of the draft Shade & Tree Plan, particularly where harvested water can support trees, landscape areas, and shade infrastructure. The Plan is intended as a policy and design guidance document rather than a citywide engineering or utility performance program. While basin size and annual rainfall can help estimate theoretical capture volumes, actual infiltration and reuse performance can vary significantly based on soil conditions, basin design, compaction, maintenance, storm intensity, runoff routing, groundwater conditions, and site-specific constraints. For that reason, the draft Plan does not establish a single citywide stormwater infiltration target. Instead, it promotes project-level retention, infiltration, and water harvesting strategies that can be sized and evaluated based on specific site conditions.	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/22/2026
Shade Structure Guidelines					
56	General, Page 84, Guideline SS 7	Suggested outreach to Scottsdale Public Art, particularly to get input on shade structures that could also function as public art, similar to the Civic Center examples.	The Plan as drafted (Page 84) contemplates this dual-purpose for shade structures: SS 7 Use shade structures to strengthen placemaking and neighborhood identity. SS 7.2 Coordinate with Scottsdale Public Art or other community partners when designing large or iconic structures in civic spaces.	Neighborhood Advisory Commission, Comment Received During Regular Meeting Agendized Item	3/25/2026
Old Town Guidelines					
57	Page 103, Old Town Major Street Palettes	How did we get to this Old Town tree palette?	The Old Town tree palette was developed by balancing shade performance with established corridor character. In doing so, staff reviewed previously implemented streetscapes along those roadways and considered existing tree prevalence, Major Street character, shade effectiveness, and compatibility with surrounding land uses. The intent was to maintain a consistent streetscape rhythm and strengthen Old Town identity while improving long-term shade outcomes.	Parks and Recreation Commission, Comment Received During Regular Meeting Agendized Item	3/18/2026
Appendix					
58	General, Appendix, Related Plans & Policies Pages 112 - 113	11. does not mention the existing Heat Mitigation Plan nor the pedestrian shade orientation standards (within the existing Transportation Action Plan).	The Plan is not intended to restate every related City plan, policy, or standard in detail. Rather, it includes a Related Plans & Policies section identifying a broad range of relevant guidance and is intended to operate alongside those documents by providing focused design guidance for shade infrastructure in the built environment. Updated Text Page 113 Related Plans & Policies **TRANSPORTATION ACTION PLAN (2022)**	Scottsdale Environmental Advisory Commission, Individual Commissioner Comment Submitted Online	4/17/2026

Planning and Development Services
Long Range Planning

7447 East Indian School Road, Suite 105
Scottsdale, Arizona 85251

To: Development Review Board

From: Taylor Reynolds, Principal Planner

Through: Brad Carr, AICP, Board Liaison

CC: Erin Perreault, AICP, Planning & Development Senior Director
Tim Curtis, AICP, Planning & Development Area Director
Adam Yaron, Planning & Development Area Manager

Date: May 5, 2026

Re: Item 3: 11-DR-2025 (Shade & Tree Plan for the Built Environment)

Staff received the enclosed public comments from a resident after posting the May 7, 2026 Development Review Board agenda packet. The commenter identified the comments as specific to the Guidelines portion of the draft Shade & Tree Plan for the Built Environment (pages 27–114). Given the volume and technical nature of the comments, staff is providing them in advance of the meeting.

Staff is currently reviewing the comments and will coordinate with the City's project consultant to determine whether any clarifications or modifications may be appropriate. If warranted, staff will present any proposed modifications for consideration at the May 7, 2026 meeting.

If any additional comments are received before the meeting, staff will ensure they are transmitted to the Board.

ENCLOSURE

1. Public Comment Received on May 5, 2026.

Enclosure 1

Reynolds, Taylor

From: A. McMahon <mcmahon.a@cox.net>
Sent: Tuesday, May 5, 2026 9:20 AM
To: Carr, Brad; Reynolds, Taylor
Subject: DRB May 7, 2026 Agenda Item #2
Attachments: The Guidelines 5.1.26 draft McMahon comments.pdf

⚠ **External Email: Please use caution if opening links or attachments!**

Brad and Taylor,

Please find attached my comments on the Shade & Tree Plan draft posted last Friday (May 1). These comments cover The Guidelines portion of the plan (pages 27-114).

I've been working on comments, and was caught betwixt and between the earlier draft and the "next" draft to be considered by DRB (that posted on Friday).

I have not previously submitted comments, so these comments are not duplicative.

Brad, I am unable to email my comments to DRB members as there is no mechanism to upload attachments through DRB's website. So please email my comments to DRB members this morning. Because the comments include exhibits and photographs, please distribute them in the format submitted, as opposed to putting them into a matrix. Thank you. If you are unable to distribute the comments to DRB members this morning, please advise.

Thank you,
Alisa McMahon

Feedback re: The Guidelines – February 2026 Draft posted May 1, 2026

pg-# comment number

Trees

For easy reference, the recommended distances in the Tree Guides (pages 39-47) are compiled into three tables (Small, Medium and Large Trees) in Exhibit 1 herein.

31-1 TR 1.1 – With respect to street frontages, TR 1.1 and the Tree Guides conflict with DSPM 8-1.203.

DSPM 8-1.200 Landscape Guidelines for streetscape designs and infrastructure.
DSPM 8-1.203 "Planting distance between trees shall be no less than the mature canopy width."

Per DSPM, the minimum separation between trees **shall be** mature canopy width. TR 1.1 recommends a maximum separation of 25 feet O.C. The Tree Guides list a Ⓒ Distance Apart (O.C.) for each tree in the Guide, without reference to minimum or maximum.

Examples of conflicts between DSPM, TR 1.1 and Tree Guides (TG) are summarized in this table:

mature canopy width [1]	DSPM 8-1.203	TR 1.1	Tree Guides Distance Apart for example tree [2]	conflicts between	example tree from Tree Guides
10	≥ 10	note 3	6	DSPM and TG	anacacho orchid
15	≥ 15	note 3	8	DSPM and TG	texas mountain laurel
20	≥ 20	≤ 25	10	DSPM and TG	mastic
25	≥ 25	≤ 25	20	DSPM and TG	palo verde
> 25	≥ canopy width	≤ 25	n/a	DSPM and TR 1.1	n/a
30	≥ 30	≤ 25	24	DSPM and TG DSPM and TR 1.1	sweet acacia
50	≥ 50	≤ 25	24	DSPM and TG DSPM and TR 1.1	live oak
50	≥ 50	≤ 25	30	DSPM and TG DSPM and TR 1.1 TR 1.1 and TG	tipu
Note 1 Source (except for > 25): Tree Guides; see Exhibit 1, Tables 1 - 3, column Ⓑ Mature Width.					
Note 2 Source: Tree Guides; see Exhibit 1, Tables 1 - 3, column Ⓒ Distance Apart (O.C.).					
Note 3 Considered "smaller trees"? If so, TR 1.1 may not be relevant.					

Resolve the conflicts.

31-2 TR 1 – For all but three trees, the Tree Guides recommend a planting distance closer than mature width. The difference ranges from 1 foot to 26 feet. (See Exhibit 1, Tables 1 - 3; compare columns Ⓒ Distance Apart and Ⓑ Mature Width. Red font in column Ⓒ Distance Apart indicates the recommended distance is less than Ⓑ Mature Width.) Recommendations and requirements to space trees at or (as required by DSPM 8-1.203) "no less than" mature canopy width are common. In fact, even within this document, the Old Town Scottsdale Character Area Tree Guidelines call for tree spacing to match mature canopy width (OT 1.2.1). It would therefore be helpful if the Tree Guidelines explained the rationale behind the Ⓒ Distance Apart recommendations.

31-3 TR 1.2 – Define "smaller tree species." The Tree Guides recommend a planting distance closer than mature width for 8 of the 11 trees in the Small Trees category.[1] The recommended planting distances range from 50% to 80% of mature width. (See Exhibit 1, Table 1; compare columns Ⓒ Distance Apart and Ⓑ Mature Width.) Again, it would be helpful if the Tree Guidelines explained the rationale behind the Ⓒ Distance Apart recommendations.

31-4 TR 2.1 and 2.2 – The Environmentally Sensitive Lands Ordinance and the Fire Code are currently being revised. 10' and 5' between trees and structures may conflict with new Fire Defensible Space provisions.

31-5 TR 2.1 – 10 feet between trunk and structure is very close. In the Tree Guides, 14 of the 15 Medium and Large Trees have a listed width at maturity of 25 - 50 feet.[2] The one exception is date palm. (See Exhibit 1, Tables 2 and 3, column Ⓑ Mature Width.) Most irrigated trees exceed expected size.

Figure 1-2 depicts a tree canopy far exceeding the available space. The portion of canopy shaded gray could only exist if and after the bottom of the tree canopy exceeds the building height. But long before then, that side of the tree would have been chopped back, never to recover its natural form. What is the rationale for recommending trees be planted any closer to structures than half their mature canopy width?

31-6 TR 2.2 – 5 feet between trunk and structure is very close, even for "smaller" (undefined) trees. In the Tree Guides, 8 of the 11 Small Trees have a listed width at maturity of 15 - 20 feet.[3] (See Exhibit 1, Table 1, column Ⓑ Mature Width.) Most irrigated trees exceed expected size.

Figure 1-2 depicts a tree canopy far exceeding the available space. The portion of canopy shaded gray could only exist if and after the <u>bottom</u> of the tree canopy clears the building height, which is unlikely for smaller trees. The Small Trees in the Tree Guides range from 10 - 25 feet tall (to <u>top</u> of canopy). What is the rationale for recommending trees be planted any closer to structures than half their mature canopy width?

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[1] This count includes Texas ebony which, with a listed height of 20 feet, should be in the Small Trees, not the Medium Trees, category.

[2] This total excludes Texas ebony from the Medium Trees count.

[3] This count includes Texas ebony in the Small Trees category.

31-7 The Tree Guides list a minimum distance to building for each tree. The recommended distances range from 4 - 10 feet for Small Trees, 5 - 10 feet for Medium Trees, and 4 - 15 feet for Large Trees. The recommended distances are shorter than half the tree's mature canopy width for all the Large Trees, all the Medium Trees, and five of the Small Trees.[4] (See Exhibit 1, Tables 1 - 3; compare columns Ⓓ Minimum Building Distance and Ⓑ Mature Width. Red font in column Ⓓ Minimum Building Distance indicates the recommended distance is less than half of Ⓑ Mature Width.)

31-8 TR 2.1 – Add "minimum" (as in TR 2.2 and Figure 1-2): "10' minimum measured from …"

31-9 Figure 1-2 and other plan view (overhead) drawings – change label "tree" to "tree canopy."

32-1 TR 3 reads oddly because minimizing heat retention means planting trees closer to hardscape while reducing root damage means planting trees farther from hardscape. Perhaps acknowledge that tension with something like: "Balance minimizing heat retention with reducing the risk of root conflicts with nearby hardscape."

32-2 TR 3.1 and 3.2 – 5 and 3.5 feet are very short. The Tree Guides recommendations for minimum distance to sidewalk are likewise short; the range is 4 - 7 feet. (See Exhibit 1, Tables 1 - 3, column Ⓐ Minimum Sidewalk Distance.) With these short distances, **enforcement** of soil volume and quality **requirements** (as well as proper irrigation practices) will be necessary for both tree viability and hardscape protection.

32-3 TR 3.2 – Define "smaller" trees. Note that 8 of the 11 Small Trees in the Tree Guides have a listed width at maturity of 15 - 20 feet.[5] (See Exhibit 1, Table 1, column Ⓑ Mature Width.) Tree root zones extend beyond the dripline.

32-4 3.1 and 3.2 – Add "minimum" (as in Figure 1-3):

TR 3.1 "5' minimum measured from …"

TR 3.2 "3.5' minimum may be acceptable …"

32-5 TR 3.2 and Figure 1-3 – Use either 3.5' or 3'6" for both.

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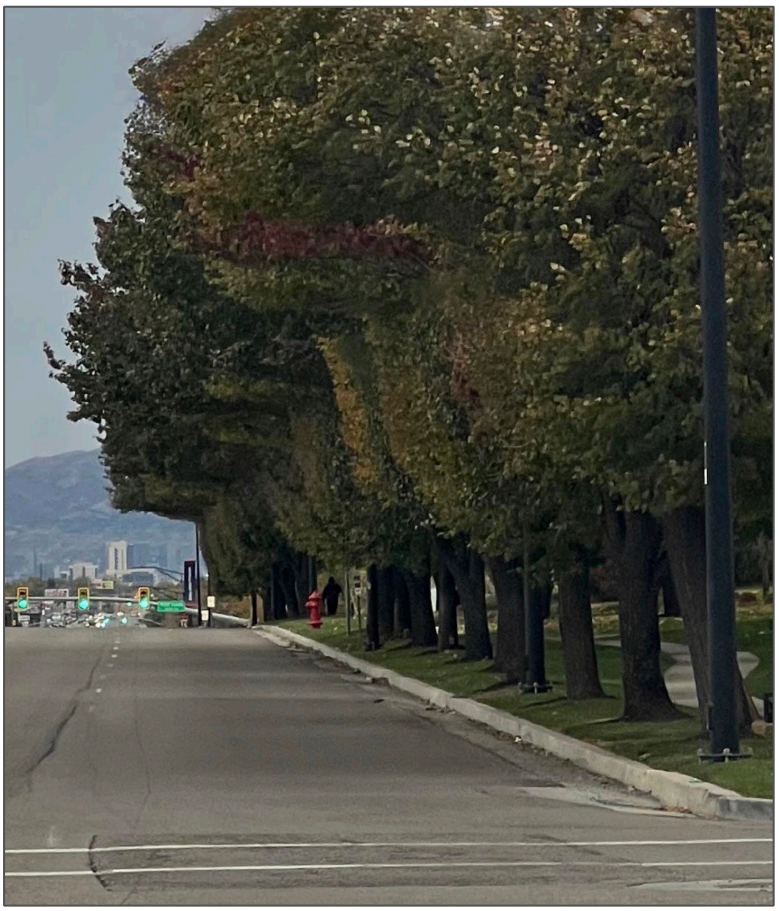
[4] This count includes Texas ebony in the Small Trees category.

[5] This count includes Texas ebony in the Small Trees category.

32-6 What about streets?



DSPM 8-1.203: "Trees should be located so that the expected mature tree canopy does not ultimately extend into the street rights-of-way …" Why? To prevent the butchering of trees as seen in this photograph.

The Tree Guidelines pledge to deliver "detailed direction" about spatial constraints. What about streetscapes?

In TR 3, is "hardscape" intended to include streets? If so, that is not clear in Figure 1-3 or the text.

The Tree Guides list a recommended Minimum Street Distance for each tree. The distances range from 4 - 8 feet; most are 5 or 6 feet. (See Exhibit 1, Tables 1 - 3, column Ⓐ Minimum Street Distance.) What about trees not included in the Tree Guides?

3.5, 5 or 6 feet – the inevitable result is the same. Given the necessary 13.5' vertical clearance over streets, planting trees that close to the street will ensure the butchering of our streetscape trees – canopies either severed at the curb line or carved out in an upside-down **L** as in this photograph. *Why would we promote that?*

Young trees are right now being planted in medians along North Scottsdale Road between Jomax and Dixileta. Will their canopies have adequate space to grow and thrive? Or will they meet the same fate as the trees in this photograph?

DSPM, by providing special selection criteria for trees planted within 10 feet of roadways, implies that trees generally should be planted further away.

> Select a tree genus or species with rapid vertical growth, columnar shape, or which develops a canopy rapidly when planting trees less than 10 feet from back of curb. (8-1.203)

(Parenthetically, rapid vertical growth and columnar shape make sense; rapid canopy development does not.)

Address streetscape planting distances.

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32-7 Tree Placement – a real-world example of what this Guideline should prevent

PALO VERDE *Parkinsonia spp.*	Tree Guides	TR 2	TR 3	actual
Size (h x w)	25' x 25'			
Min Sidewalk Dist.	5'		5'	8'
Min Street Dist.	6'			12'
Min Building Dist.	8'	10'		15'

Minimum Distance to Sidewalk/Hardscape: A native foothills palo verde (*Parkinsonia microphylla*) heaved a section of my front walkway located 8 feet from its trunk, creating a serious trip hazard, an expensive repair, and very sadly, removal of the tree – *exactly what these Design Guidelines are intended to prevent!* Per the Tree Guides, for *Parkinsonia* species, the minimum distance to sidewalk is just 5 feet; the same distance is recommended in TR 3.1.

Minimum distance to street: Per the Tree Guides, the recommended minimum distance to street for *Parkinsonia* species is 6 feet. This tree was planted 12 feet from the street, and required frequent and aggressive chopping to maintain the municipal and HOA-required 14' vertical clearance over the street.

Minimum distance to building: The recommendations are 10 feet in TR 2.1 and 8 feet in the Tree Guides for *Parkinsonia* species. This tree was planted 15 feet from the house, and asymmetrical trimming was eventually required on that side of the tree too.

Ultimately, the beautiful multi-trunk tree lost its natural form, disfigured by the chopping required by its built environment. Incidentally, these problems were not caused by overwatering. During establishment, the tree was irrigated per low water use guidelines for native trees; thereafter, it was disconnected from irrigation. In sum, the minimum distances in these Guidelines need further evaluation.

32-8 TR 4.1 – "Etc." should include trails. An 8-foot vertical clearance is low for trails, especially trails used by equestrians and cyclists. DSPM 8-3.201 - 204 require vertical clearance of at least 10 feet above trail tread for all types of trails, with 12 feet either "desired" or "preferred" for three of four trail types.

32-9 TR 4.1 – Add a) "minimum" to be consistent with Figure 1-4 and b) "vertical" to be consistent with TR 4.2: "8' minimum vertical clearance from a pedestrian facility …"

32-10 TR 4.2 – Add "minimum" to be consistent with DSPM and Figure 1-4: "13.5' minimum vertical clearance from drivelanes is recommended."

32-11 TR 4.2 – In the 5/1/26 draft, 14 feet was changed to 13.5 feet, presumably to be consistent with DSPM. Per Alison Tymkiw, Scottsdale's solid waste and fire trucks are 13'-7" tall. Many communities require 14' vertical clearance for tree canopies over drivelanes and parking lots. The 14' standard also comports with federal requirements for federal routes in urban areas (except a single 16' route). We might consider amending DSPM to require 14' vertical clearance.

33-1 TR 5.4 – Add "minimum" to be consistent with DSPM and Figure 1-5:
"The trunk of a tree should be a minimum of 7'~~+~~ from underground utilities."
(The strike-through across the plus sign is not visible; the plus sign should be deleted.)

34-1 Figure 1-6 – The font size is very small in Figure 1-6 and most of the figure titles in Trees, Water Harvesting and Shade Structures. Compare the font size in these titles: figure 1-6 (most common), figure 1-10 on page 49 (there are two figure 1-10s), figure 1-13 on page 55, and figure 1-14 on page 56.

34-2 Figure 1-6 – Add a large-font explanatory header here and above other figures where such content would enhance understanding of the figure. For example, compare no header here versus the header on figure 1-10 on page 48 (there are two figure 1-10s).

35-1 TR 7.1 – The 5/1/26 change needs to be clarified.
- "Generally assume" in what situation? I *think* the intention is to assume 3 feet of rootable depth in UNpaved and UNcompacted areas. But that is not clear. For one reason, TR 7 is about "paved or compacted areas."
- Perhaps the assumption should go on page 34.
- What does "unless otherwise justified by the planting system" mean?

35-2 TR 7.3 – "Supported soil systems" is not used anywhere else in The Guideline. Replace with "suspended pavement" if that's accurate; otherwise define.

35-3 Figure 1-7
- Enlarge the image. In print format, it is too small, and there is ample space on the page.
- Explain that the image is a cutaway that demonstrates how the system functions below grade.

35-4 TR 8 – The 5/1/26 change has negated TR 8. First, when would it *not* be necessary to take measures to address compacted soil? Second, the addition of "compaction" is superfluous; TR 8.1 and TR 8.2 already specified that they apply to compacted soil. Third, TR 8.3 (passive water harvesting) should *not* be limited to compacted soil (and that notion is *not* consistent with these Guidelines). Fourth, see first paragraph on page 34; soil quality is important! Restore TR 8 to the prior language.

35-5 TR 8.1 – The 5/1/26 addition has negated TR 8.1. First, as TR 8.1 states, it applies only to compacted soil. It therefore does not apply to situations where uncompacted native soil is acceptable. Second, it states "*amend*." That means native soil *will* be used, with organic matter or mulch *added*. Third, "where feasible" is vague. Fourth, if your goal was to add a statement in support of planting native trees in (uncompacted) native soil, do it on page 34 or as TR 8.4. Restore TR 8.1 to the prior language.

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36-1 Green box at top – The 5/1/26 change does not make sense; "tree diversity" and "biodiversity" are not the same thing. Before the change, the sentence read:

"Apply the 30/20/10 Rule to promote biodiversity, support healthier ecosystems, and enhance visual variety."

Apparently, the desire was to remove the 30/20/10 Rule. Suggested alternative:

"~~Apply the 30/20/10 Rule~~ Ensure tree diversity to promote biodiversity, support healthier ecosystems, and enhance visual variety."

37-1 Was consideration given to including a list of trees that are not recommended, e.g., *Parkinsonia aculeata*?

38-1 The terms "back of curb" and "back of sidewalk" are not commonly used outside of design/ planning contexts. Define these terms for non-professionals who might use The Guidelines.

39-1 6th bullet – "Pool-friendly (Root Damage Potential): Highlights the likelihood of roots causing issues with pools, sidewalks, utilities, or nearby structures."

Pool-friendly and root damage are related, but different. For the five reasons below, I suggest a) this bullet deal with root damage potential and b) pool-friendly trees (low litter + low root damage potential) be addressed in Site-Specific Tree Lists on page 38.

1. As stated in the quote above, roots cause damage to more than just pools.
2. "Pool-friendly" is typically related to litter, which is the bullet above this one on page 39.
3. In the Tree Guides, Texas mountain laurel, yellow bird of paradise, Texas ebony, and date palm are listed as pool-friendly and medium litter producers.
4. Elsewhere in The Guidelines, invasive roots are a separate issue, not related to pools or litter potential (see TR 2.2, TR 3.2 and TR 5.2).
5. TR 2.2 references the Tree Guides to find smaller trees with non-invasive root systems for which a 5-foot separation between tree and structure may be appropriate. Three small trees in the Tree Guides with a listed minimum distance to building of 5 feet are also listed as not pool-friendly (anacacho orchid, chaste tree, palo blanco). Is the latter a root issue or a litter issue?

39-2 39 through 47

- It's difficult to see the water drops against background colors, especially in Large Trees.
- The color-coding of the background by tree size doesn't seem to be needed.
- For legibility, use lighter background color(s) and black font.
- In each size section, place the trees in some logical order, e.g., alphabetical by botanical name.

43-1 43 through 45 – Medium Trees

- Based on listed height (20 feet), Texas ebony should be in the Small Trees section.
- Add a note about the size range between different species of palo verde and mesquite, e.g., native and South American mesquites.
- Coolibah litter should be low, medium or high, not "moderate."

48-1 There are two Figure 1-10's (pages 48 and 49); all figure numbers are "off" after page 48.

48-2 TR 11.1 and Figure 1-10 (on page 48) do not belong with Tree Staking and should be moved elsewhere.

48-3 TR 11.1 – Cite to Figure 1-10 at end of sentence.

48-4 Figure 1-10 header: "Planting Depth to Maintain Root Flare Just Above Finished Grade" or "Correct Planting Depth"

48-5 TR 11 – More pages are devoted to staking than to watering! Staking can do more harm than good. Trees produces strong, dense wood when trunks move and bend in the wind. Staking should be done only if a tree cannot stand without it. If staked, stakes and ties should be removed as soon as possible, usually within the first year. Add balance to the staking discussion.

48-6 TR 11.3 and 11.4 – Small, medium and tall here presumably refer to size at planting as opposed to mature size, and that should be stated. It would be helpful to provide a general sense of size by container, e.g., 15 gallon, 24-inch box.

49-1 There are two Figure 1-11's (pages 49 and 50); all figure numbers are "off" after page 49.

49-2 Figure 1-11 – In the Triple Stake MAG Detail, the label "2 lodgepole pine stakes" should read "3 lodgepole pine stakes."

50-1 After 6 Months - Tree Health Check:
"Gently wiggle" and "without excessive movement" are very subjective. Consider this alternative:

> A noticeable trunk flare should be visible. Grasp the tree with two hands and move it back and forth. No visible soil movement at the base of the tree indicates the roots have anchored and the stakes can be removed.

51-1 TR 12 – Add:

TR 12.X Put trees on separate valves from shrubs, groundcovers and grass.
TR 12.X Assign separate valves to planting areas near pavement, reflected light, and south and west exposures.

51-2 TR 12.4 – The key to "adjust[ing] emitter placement outward as trees mature" lies in the design and installation of the irrigation lines at planting. Best practice is to design and install the irrigation system for the life of the tree (or to establishment if irrigation is to be discontinued then). See Exhibit 2 herein. In the "Loop Design," all irrigation lines that will at planting or in the future deliver water – from the rootball to the mature canopy dripline – are installed at planting; emitters and plugs are exchanged over time as the dripline and root zone expand outward. This drawing could be improved upon and a better version added to The Guidelines.

51-3 TR 13.1 and 13.2 can both be accomplished without a "smart" controller and should not be limited to the use of a smart controller. Delete TR 13 and put under TR 12:

TR 12.X Adjust watering frequency based on tree age.
TR 12.X Adjust watering frequency based on weather and seasonal conditions.
TR 12.X Utilize smart irrigation controllers to automate watering schedules.

51-4 Figure 1-12 title references the wrong TR number; it should be 12.4.

51-5 Figure 1-12 – Add a large-font explanatory header here and above other figures where such content would enhance understanding of the figure. For example, compare no header here versus the header on figure 1-10 on page 48.

51-6 Figure 1-12 – The concentric circles and year numbers are hard to make out. Make circles white all the way around; make numbers bigger and bold.

52-1 Table 1-1 – Good in that it sets out the relationship between stage, age and watering frequency. Concerning in that it ignores seasonal variation. Is "Minimums" meant to imply winter? Or do the given frequency ranges cover all seasons? Is the stated frequency for low water use trees? Or do the given frequency ranges cover all water use trees? Clarification needed.

52-2 Summer box – Change "early in the morning" to "before sunrise."

52-3 Wet Summer box – Explain what "if … temperatures allow" means.

52-4 Wet Summer box – The meaning of "avoid fertilizing & watering" is ambiguous. It could mean avoid fertilizing and avoid watering, or it could mean avoid doing both at the same time. Clarify the meaning. (Of course, native trees do not need fertilizer at any time of year, but fertilization is not addressed in The Guidelines except here.)

52-5 Winter box – "and potential frosts" doesn't make sense. Should it read "from potential frosts"?

52-6 Arrange the page such that the bulleted items in the seasonal boxes can be in larger font.

54-1 TR 14.2 – Add "vertical" for consistency with DSPM and clarity: "Maintain required vertical clearances …"

54-2 TR 14.2 – Add: vertical clearance above paths and trails. DSPM 8-3.201 - 204 require vertical clearance of at least 10 feet above trail tread for all types of trails, with 12 feet either "desired" or "preferred" for three of four trail types.

54-3 TR 14.2 – 14' was not changed to 13.5' here as it was in TR 4.2.

55-1 TR 16.2 – "Evaluate species tolerance and consider tree age" needs further explanation.

55-2 TR 16.7.4 – Add illustration.

55-3 Figure 1-13 – The trees are too small; they must be larger to effectively communicate "before" and "after." Enlarge.

55-4 Figure 1-13 – In the "Crown Reduction" illustration, the "after" tree does not depict the "before" tree with branches removed. Instead, it is a reduced-size copy of the "before" tree. That is not how the other three before/after illustrations are handled. Correct the "Crown Reduction" "after" tree.

56-1 Harmful Practices to Avoid – Illustrations are needed for some of the practices to avoid: flush cuts, stub cuts, anvil-type pruners, and especially topping and tipping. As examples, see Exhibit 3 herein and photographs at www.chandleraz.gov/residents/water/water-conservation/education-and-resources/for-commercial-and-hoas/pruning-trees-in-the-desert.

Water Harvesting

57-1 The text in blue boxes is hard to read. For legibility, use lighter background color.

58-1 58 & 59 – The photos are not appealing. Replace with photos that will encourage water harvesting.

59-1 WH 1.1 – Clarify the meaning of "before underground piping." Some options:
"… GSI features instead of underground piping."
"… GSI features, using underground piping only for overflow."

59-2 WH 1.2 – Clarify the meaning of "GSI locations." I think you mean: "Align the location of GSI features with desired shade areas …"

59-3 WH 2.1 – "Locate basins and other GSI features …"

59-4 WH 2.2 and 2.3 do not belong under WH 2; move to WH 8 (route runoff to protect water quality and adjacent infrastructure).

60-1 WH 4.2 – I understand identifying passive as a primary strategy, but why discourage active systems ("add … only where … justify active systems")? Scottsdale faces imminent, large, long-term CAP supply cutbacks. Why not capture, for later irrigation use, stormwater runoff that will otherwise go to waste? Strategies that may not have met the benefit/cost ratio in the past will have to be reevaluated before the ink is dry on this design guideline.

61-1 Photo label – "~~Vegitated~~ Vegetated bioswale"

61-2 Vegetated bioswale photo – It appears water would have to flow uphill to enter the planting area. In other words, it looks like the natural flow is out of the planting area and down the street. That may be an artifact of the camera angle, but nonetheless, this is not a good illustration of GSI.

61-3 61, 62, 64, 109 – Internal inconsistency: "Typical Storm Depth Across Scottsdale" (page 62) states that a 1-inch rainfall depth "provides a reliable basis for planning and sizing water harvesting systems." The 1-inch depth is based on data collected at five monitoring stations across Scottsdale. The example in the Rainfall Capture Calculator (page 64) utilizes a 1-inch storm depth. However, WH 6 (page 61) states: "Size systems to capture the first flush (at minimum)." "First flush" is defined as the first 0.5 inch of runoff (page 109). WH 6.1 (page 61) states systems should be sized "to capture and infiltrate a minimum of 0.5 - 1.0 inch of rainfall." So which is it – 0.5 inch or 1.0 inch? Designing for 0.5 inch would send a lot of precious water to the storm drain – which, unlike the sewer, is not recovered for reuse.

62-1 1st paragraph – "… 7.66 inches of rain each year~~,~~. While some …"

64-1 WH 7.1 – "Design basin footprint, depth, and side slopes based on … hard surface slopes …" The addition of "hard" distinguishes between the slope of adjacent hard surfaces and the side slopes of the basin. "Hard surface" is the term used in the Rainfall Capture Calculator on the same page. "Impermeable surface" is used on page 67. Either term works.

66-1 66 through 75 – The illustrations are too dark, too small, and thus very difficult to see in both print and electronic formats, especially (but not only) the underground components.

66-2 Figure 2-1 – Is the geotextile fabric intended to wrap the perforated pipe or be a separate layer? Clarify label and drawing.

67-1 Under "Benefits," verbs should be "reduces" and "protects" (as elsewhere).

67-2 Use Case, 2nd bullet – This seems to be the only place "stormwater planters" is used within this document. Define the term or use terminology used elsewhere within the document.

69-1 2nd sentence – the meaning of "is not feasible" is unclear. Alternative:

> "It allows tree roots to grow under or adjacent to pavement where conventional, uncompacted soil cannot be used ~~is not feasible~~."

69-2 Use Case, 2nd bullet – Define "furnishing zones."

70-1 Figure 2-5 – The street slopes downhill from left to right, so the blue arrows indicate water flows uphill. To correct, add blue arrow at left (unlabeled) curb cut, reverse blue arrows inside the swale, and delete or re-orient blue arrow at right curb cut.

70-2 Figure 2-5 – What does the "6' min" dimension represent – width of the swale or a vertical differential? Because the sidewalk appears higher than the street, the dimension can be seen both ways. The text on the page does not address a 6' minimum dimension.

71-1 Figure 2-6 – Did you intend to specify *organic* mulch as the graphic does?

72-1 Use Case 2nd bullet – Shouldn't "parallel" be "perpendicular"? Bridges are needed where walkways cross over (i.e., are perpendicular to) swales and other GSI features.

73-1 Use Case 2nd bullet – Explain the "near commercial main streets" use case. Where is "near"? What is the purpose of curb extensions on what sounds like multi-lane streets lined with big box stores and strip malls? Do you instead mean pedestrian-oriented commercial streets with, for example, boutiques and cafés? Break into two bullets: 1) better describing the "commercial main streets" use case and 2) "near schools and transit stops."

73-2 Maintenance 4th bullet – Clarify the meaning of "accessible routes"? The term is also used on pages 74 and 75.

73-3 Figure 2-8 – The street slopes downhill from left to right, so the blue arrows indicate water flows uphill. To correct, reverse blue arrows in swale, move "curb cut and sediment trap" label to the left side of the curb extension, and delete blue arrow in street at lower right.

74-1 I know of (at least) two Scottsdale homes designed by Scottsdale architects that have an above-ground cistern. A photo from either would be a good example of 'detailed as a design feature' (Benefits 3rd bullet) and more appealing than the current photo. Let me know if you'd like some photos of these projects to choose from.

75-1 1st sentence – "collects and stores stormwater" – as on page 74

75-2 Figure 2-10 – Label the input pipe (as on page 74).

Shade Structures

77-1 Many benefits of structured shade are enumerated. Not included: the double-duty of solar canopies – shade plus renewable energy. Add this co-benefit of shade structures here.

81-1 "… further, vertical screens, slats, and louvers should be oriented perpendicular to southwest and west-facing exposures …" – I and others cannot make sense of this. It needs to be restated, expanded upon, and/or illustrated. It might help to distinguish between the primary structure and its components. To use a window covering analogy, a structure vertical to the ground (a window covering) can have vertical slats (a vertical blind) or horizontal slats (a mini-blind).

81-2 "60% openness" (also: SS 8.3 – "minimum 60% transparency")
Provide ideas and techniques for how to accomplish both meaningful shade and 60% openness/ transparency.

83-1 SS 5 – The solar canopy at the apartment complex in this photograph was heavily damaged by a typical consumer-rental moving truck. Many municipalities require 14' clear for shade canopies over parking lots. At the time, the municipality in which the apartment complex is located did not. Nor does Scottsdale. Per Alison Tymkiw, Scottsdale's solid waste and fire trucks are 13'-7" tall. To avoid costly damage from trucks, parking lot canopies must be at least 14 feet clear. Add:

SS 5.5 Shade structures over parking lots must have a minimum height of 14 feet clear.

83-2 SS 5.2 – All other things being equal, shorter shade structures are more effective than taller shade structures because they block sun more hours of the day, including earlier and later in the day when the sun is lower in the sky. This is not a reason to change SS 5.2, but should be a design consideration generally and particularly when evaluating whether to have trees under a shade structure. Add this design consideration in Horizontal Shade on page 80 or elsewhere.

83-3 Figure 3-4

- The structures and shade they create are very hard to see; the illustration is too dark; there is too much street for the scale of the graphic.
- Gold/yellow shapes: In print format, they cannot be identified. Magnified in electronic format, they (except the one in the middle of the street) appear to be stormwater drains – an odd choice for this document.
- In both formats, the curved shape to the right of the crosswalk is a mystery. Is it supposed to be a planter? And perhaps the yellow bit in the middle of the street is a curb cut? If so, from the drawing's perspective, the curb cut is on the downhill side of the planter.
- It's a nice thought to depict both shade structures and water harvesting, but that doesn't work in this small drawing. If the drawing cannot be enlarged and clarified, simplify it to depict only shade structures.
- Many other illustrations in the document, including figures 3-1 and 3-2, are also dark. Does the document's tan background color contribute to this problem?

85-1 Figure 3-5 – Consistency is best, with either high/black better or low/white better for all elements. Here, high/black is better for durability, while low/white is better for maintenance and heat retention. Confusing! For example, fabric has two white circles and one black circle. The black circle and one white circle are negative (high maintenance and low durability) while the other white circle is positive (low heat retention). Suggestion: do three separate scales, with either white or black as the positive end of the spectrum for all three.

85-2 85 & 87 – Solar panels do not require annual cleaning! Dust, dirt, and other soiling does reduce energy production, and cleaning does increase energy production. However, the **solar industry here and elsewhere does not recommend annual cleaning** for most applications. First, the impact of cleaning on energy production is modest. For most residential, commercial, and municipal systems, the cost of cleaning exceeds the value of additional energy recovered. Second, properly-modeled solar systems already account for an assumed production loss due to normal soiling, and that factor is built into the performance estimates. Third, rainfall provides some cleaning. Routine, periodic cleaning is thus recommended only for utility-scale solar plants, where even a slight production gain can translate into significant revenue. Remove the two references to required annual cleaning on pages 85 and 87.

87-1 SS 13 – I did not see any cautions in the Shade Structures guidelines about attaching fabric shade structures to walls and buildings. I know of a building that was *allegedly* structurally damaged by the force generated by an attached fabric shade. In addition, some HOAs prohibit shade sails from being attached to common walls. ***If*** shade sails do pose a risk to structures, perhaps a caution and/or guidelines should be included.

Design Scenarios

89-1 89 through 97

- The illustrations are very difficult to see both in print and electronic formats. So dark. Too small in print format.
- In Site Notes, the numbers are in circles. In the illustrations, the numbers are in squares.
- Can the grayed-out strip in the illustrations be fixed? Some illustrations are worse than others, e.g., 4-5.
- In all scenarios, spell out "minimum" in Site Notes ③ Soil Volumes.

89-2 The botanical name for yellow bird of paradise was changed on pages 39 and 41, but not here.

89-3 Planter dimensions are hugely important, impacting virtually every aspect of tree health and viability. Put simply, if we want more trees, we have to provide them with space to thrive without interference from, or interfering with, the built environment. As intimated on page 30 of The Guidelines, spatial constraints are one of the biggest challenges to growing our citywide tree canopy. Yet, The Guidelines are silent on Planter Dimension until page 89, and the belated message is anything but clear and comprehensive.

Ⓑ Planter Dimension appears to be equated with mature tree canopy width. See yellow bird of paradise box lower right. This linkage implies that planter widths are to be provided and/or trees selected such that mature tree canopies will be more or less contained within planter boundaries. Is that the intention? If not, what is the relationship between Ⓑ Planter Dimension and tree size, and what are the recommended planter dimensions?

The message is further muddled by the Design Scenarios on the following pages. Planter widths are labeled Ⓑ, but the depicted tree canopies far exceed planter dimensions.

The Guidelines are silent as to recommendations for planter dimensions at back of curb, back of sidewalk, street medians, parking lots, plazas, et cetera.

Because spatial conflicts between trees and their built environment are a chief contributor to tree demise, it would be a failure if The Guidelines did not carefully, consistently and realistically address those conflicts. At this point, there is no clarity regarding planter dimensions.

90-1 4-1

- Ⓒ bracket looks to be drawn between a tree and a person; move or delete the person to expose the tree trunk.
- The trees are growing into the shade canopies. This illustrates a common *problem*, not a solution.
- There is no Ⓐ for Minimum Street Distance.

90-2 4-2

- The trees are growing into the shade canopies. This illustrates a common *problem*, not a solution.
- There is no Ⓐ for Minimum Street Distance.

91-1 4-3
- Title – "Building frontage and parking ~~parking~~ lot"
- Site Note ① – The Tree Lists should be "Near Building" and "Parking Lots."
- Ⓓ bracket looks flat against the building.

91-2 4-4
- Site Note ④ does not apply. Change to: "Prioritize shade <u>on pedestrian path</u> ~~where people exit vehicles~~."
- Grass doesn't look like grass; too dark.

92-1 4-5
- Site Note ⑤ – Explain "furnishings" and "low edges."
- There is no Ⓐ for Minimum Street Distance or Minimum Sidewalk Distance.

92-2 4-6
- Site Note ④ does not make sense. Alternatives: "Trees shade the path." or "Use trees to shade the path."
- Site Note ⑤ – Explain "furnishings" and "low edges."
- There is no Ⓐ for Minimum Street Distance.

93-1 4-8
- There is no Ⓐ for Minimum Street Distance.
- Canopy of background tree looks to be in front of canopy of foreground tree.

94-1 4-10
- Wouldn't the structural soil be under the pavement? Add structural soil under the parking spaces and move ③.

95-1 4-11
- Wouldn't the structural soil be under the pavement? Move ③ from the planter to the pavement.
- Curb cuts are noticeably absent in this view and should be added to the illustration.
- Left front tree is way out of proportion.

95-2 4-12
- Site Note ② Water Harvesting Element should list curb cut.
- Curb cuts are noticeably absent in this view and should be added to the illustration.
- Add a section view across the foreground to show where suspended pavement would be located. Move ③.

96-1 4-13
- Curb cuts are noticeably absent in this view and should be added to the illustration.
- Add a section view across the foreground to show where suspended pavement would be located. Move ③.

96-2 4-14

- Figure does not make sense with one sun. It needs three suns and time of day as on pages 80 and 81. Move right (8 am) drawing to left side and left (4 pm) drawing to right side.
- It looks like the trees are under the shade structure. Is that intended? Per SS 5-2, that would require a much taller structure than one without trees underneath (to provide at least 15-20 feet overhead clearance above expected mature tree canopy height). This increased height would reduce the effectiveness of the shade structure, exposing the play area to direct sun more hours a day even with the trees shown. A better solution would be trees *adjacent to* the shade structure.
- Indicate where suspended pavement would be located.
- No ② Water Harvesting elements are shown in the drawings.
- Move ⑤ bracket from the left drawing to the right drawing where, without the shade, the position of the trees is visible.
- Remove ① in the left drawing (it's nowhere near trees).
- Site Note ② – ~~Bioswalk~~ Bioswale, rain garden, suspended pavement

97-1 4-15

- Figure does not make sense with one sun. It needs three suns and time of day as on pages 80 and 81. Move right (8 am) drawing to left side and left (4 pm) drawing to right side.
- Indicate where structural soil would be located.
- No ② Water Harvesting elements are shown in the drawings.
- ⑤ bracket in the left drawing doesn't make sense; remove.
- Ⓐ bracket is misplaced; it does not identify a "hardscape buffer" between trees and hardscape.

97-2 4-16

- ③ should be on the right drawing with the trees. No need for structural soil on the left.
- Shouldn't the structural soil extend under the pavement? Add.
- There is no Ⓐ for Minimum Street Distance.
- Ⓒ bracket is at a wonky angle.

Old Town Scottsdale Tree Guidelines

The mature tree plan in Zoning Ordinance Section 10.200(D) should be mentioned:

> In the Old Town Area, to remove a mature tree, the property owner shall submit a mature tree plan, subject to Development Review Board approval and issuance of a permit.

99-1 99 & 100 – Two pages of promise for little delivery. For example, where is all this?

> While the Street Tree Palette provides street-specific direction for Major Streets, the Old Town Scottsdale Character Area Tree Guidelines apply more broadly, offering principles for tree placement, health, and maintenance throughout the Old Town network of streets, plazas, and pedestrian connections. These guidelines establish the technical foundation for achieving consistent, high-performance shade and landscape outcomes across varying contexts.

101-1 OT 1.5 – So open spaces larger than 2,500 square feet with no "landscape area" will have no trees. Likewise, open spaces larger than 2,500 square feet with less than 500 square feet of "landscape area" will have no trees.

How will these Guidelines change the colors on the maps on pages 10 and 11? How will they increase comfort, walkability, desire to spend time in Old Town, and foot traffic for downtown businesses?

104-1 OT 2 – This should apply to the entire city. Move to Tree Guidelines.

104-2 OT 2.1 – The front doors of my small 4-door sedan have a 3-foot opening radius. If I park one foot from the edge of a stall, I will be able to fully open my door without bashing the 1.50 caliper trunk of a newly-planted tree. However, as the trunk grows, I will not be able to fully open my door.

104-3 OT 2.2 – "Minimum clearance of 7 feet above parked vehicles" presumably means 7 feet off the ground. That is not sufficient for delivery vans, passenger vans, high clearance vehicles, et cetera. Moreover, it conflicts with DSPM 2-1.305(C)(1): For parking area landscaping, use plant material "that can have a canopy bottom at least 10 feet above the ground."

Exhibit 1 is compiled from the distances in the Tree Guides on pages 40-47.

The trees in each table – Small, Medium and Large – are sorted by Ⓑ Mature Width. Then, trees of the same Mature Width are sorted by Ⓓ Minimum Building Distance.

In these three columns, red font represents distances less than half of the tree's Mature Width.

Ⓓ Minimum Building Distance (ft)	Ⓐ Minimum Street Distance (ft)	Ⓐ Minimum Sidewalk Distance (ft)

In this column, red font represents distances less than the tree's Mature Width.

Ⓒ Distance Apart (O.C.) (ft)

Table 1 – Small Trees

Small Tree	Ⓑ Mature Width (ft)	Ⓓ Minimum Building Distance (ft)	Ⓐ Minimum Street Distance (ft)	Ⓐ Minimum Sidewalk Distance (ft)	Ⓒ Distance Apart (O.C.) (ft)
yellow bird of paradise	10	4	8	4	8
anacacho orchid	10	5	6	6	6
palo blanco	10	5	6	6	10
mulga	15	5	5	5	12
chaste tree	15	5	6	6	10
texas mountain laurel	15	6	6	4	8
cascalote	15	10	5	7	20
feather bush	15	10	6	6	15
mastic	20	8	6	6	10
desert willow	20	10	6	6	15

Table 2 – Medium Trees

Medium Tree	Ⓑ Mature Width (ft)	Ⓓ Minimum Building Distance (ft)	Ⓐ Minimum Street Distance (ft)	Ⓐ Minimum Sidewalk Distance (ft)	Ⓒ Distance Apart (O.C.) (ft)
texas ebony [1]	15	8	6	6	10
date palm	20	5	8	5	16
palo verde	25	8	6	5	20
chinese pistache	25	10	5	5	20
fruitless olive	25	10	8	6	20
ironwood	25	10	5	7	20
coolibah	25	10	5	5	24
sweet acacia	30	8	5	7	24
mesquite trees	30	10	6	5	24
mesquite seedless	30	10	6	5	24

Note 1: With a listed height in the Tree Guides of 20 feet, Texas ebony should be included in the Small Trees category.

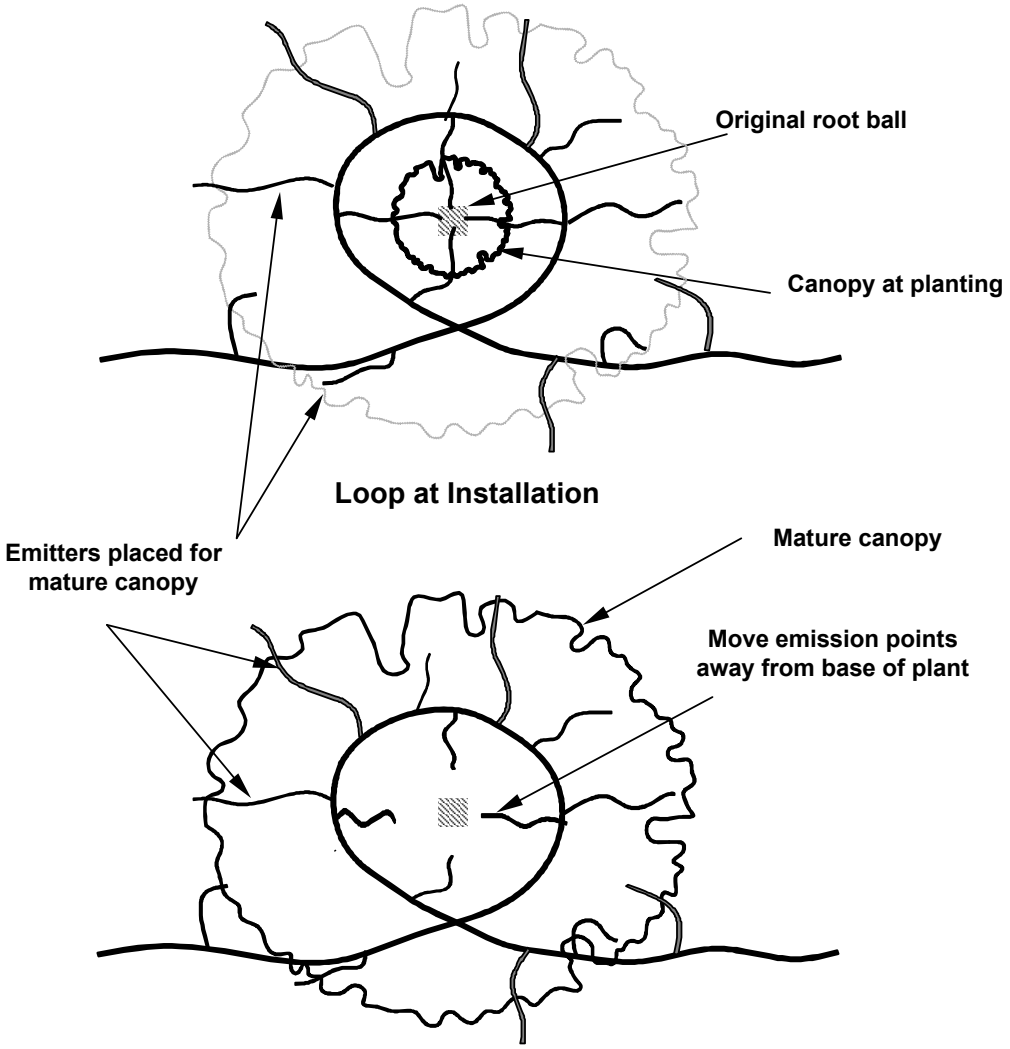
Text

Table 3 – Large Trees

Large Tree	Ⓑ Mature Width (ft)	Ⓓ Minimum Building Distance (ft)	Ⓐ Minimum Street Distance (ft)	Ⓐ Minimum Sidewalk Distance (ft)	Ⓒ Distance Apart (O.C.) (ft)
ghost gum	25	4	4	4	20
shoestring acacia	30	8	5	5	24
willow acacia	30	10	5	5	24
chinese elm	45	10	5	5	24
live oak	50	10	5	5	24
tipu	50	15	6	6	30

APPENDIX G

EMITTER PLACEMENT EXAMPLES



Loop Design

Pruning Trees in the Desert

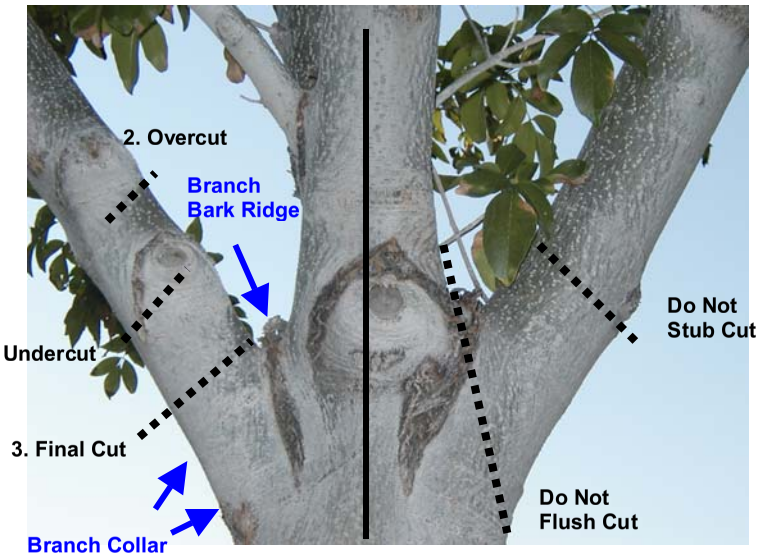
Keeping Trees Healthy and Beautiful With Proper Pruning

Pruning is a skill and an art. The skill is in making cuts in the right places that allow the wound to close properly and minimize the chance for decay. The art is in removing only the branches needed so that the tree remains attractive and in its natural form.

Reasons for Pruning

Have a good reason to prune before starting

- Remove dead, weakened or damaged branches.
- Remove crowded or rubbing limbs.
- Eliminate hazards in the landscape such as branches in walkways or those blocking safe visibility.
- Improve tree stability, balance, and wind resistance.
- Control or direct growth.



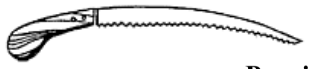
What to do **What NOT to do**

Tools Needed for Pruning

Use the proper pruning tool depending on the limb size.

Hand pruning shears are used for limbs less than inch in diameter.

Pruning loppers are used for limbs less than 1 inch in diameter.



Pruning saws are used on limbs measuring over 1 inch in diameter.

How To Prune

Never remove more than of a mature tree's leaves in a growing season.

- Do not prune a newly planted tree during the first year, except to remove dead or badly damaged branches.
- Always cut back to a main stem or branch just outside the branch bark ridge and branch collar (this allows the wound to close properly).
- To not tip back, leave stubs or make a flush cut. These allow entry points for diseases and insects.
- For large branches use a three cut process to prevent bark from ripping down the main trunk (see above).

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Never Top a Tree!

Because topping....

- Is the indiscriminate cutting back of tree branches to stubs.
- Stresses trees by removing the leaves or "food factories" of the tree.
- Creates hazards since new shoots are weakly attached, making them prone to breakage.
- Makes trees unsightly by disfiguring their natural branching structure.

Work Safely

Don't forget these safety pointers while pruning:

- Never prune a tree that is touching or near a utility line.
- Do not prune when you are overheated or tired.
- Use protective hats, gloves, and safety glasses.
- Do not climb a tree or use a ladder when pruning.

Call a certified arborist to have trees properly pruned or for additional tree care advice.

Pruning paints or other sealants are not necessary. A properly pruned tree will be able to protect itself.

Exhibit 3

Enclosure 1